



Annual Report 2001-2002

SREE CHITRA TIRUNAL INSTITUTE FOR
MEDICAL SCIENCES AND TECHNOLOGY

THIRUVANANTHAPURAM - 695 011

KERALA, INDIA



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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.





Institute Body

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Sri. Pon Radhakrishnan

Member of Parliament (Lok Sabha) with effect from 1.8.2000.

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Professor of Cardiology, All India Institute of Medical Sciences, New Delhi - 110 029.

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Governing Body

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Overview

THE Institute made substantial progress in the fields of biomedical technology development, hospital services, public health initiatives and biomedical research.

The quality system conforming to ISO/IEC/17025 for testing and evaluation of biomaterials and devices was implemented and the final auditing and accreditation are expected early next year. The first industry sponsored R&D project for developing Membrane Oxygenator, a new diagnostic kit for field testing of antibiotic sensitivity of mastitis milk and the large diameter vascular graft are undergoing clinical trials, even as new technologies on heparin coating of intra-ocular lens, centrifugal blood pump and disposable ECG electrodes are at various stages of design and development. The Institute also undertook testing of coronary stents and medical devices packaging successfully for industrial customers.

The hospital completed 25 years of service to the nation and the silver jubilee year was observed with a series of seminars, workshops, symposia, get-together of alumni and guest lectures. Intraoperative electro corticography and invasive long-term monitoring of epilepsy, laser treatment for diseases of the spine and the trachea, and new diagnostic and therapeutic procedures were started to further improve the standards of patient care in the hospital. Biomedical research, involving studies on modulation of myocardial contraction in magnesium deficiency and free radical stress, relationship between Vitamin D and coronary artery disease, role of cytokines in pathogenesis of Guillain Barre syndrome are being carried out.

In the field of public health, the Achutha Menon Centre for health sciences studies continued to coordinate the networking of public health institutions in developing countries. The Centre carried out population based research on poverty and gender dimensions of south-east Asian region, surveillance of cardiovascular diseases in Indian industrial population and situation analysis of medical termination of pregnancies in India. The MPH course was recognized by both the country office and the South East Asian regional office of the WHO for fellowships.

The Institute also conducted several training programmes, short-term courses, and hosted national and international scientific conference.

The year under review was marked by not only all-round progress and development in all spheres of the Institute's activities but also in disseminating knowledge and expertise through out the country through exhibitions and symposia.



HIGHLIGHTS OF THE YEAR

The Institute wins the national award from Technology Development Board for development and successful commercialisation of indigenous technology

World Health Organization recognizes the Master of Public Health programme for country and regional fellowships and awards fellowships to 8 students.

A Vision 2020 document drafted for biomedical technology development.

A Quality System for accreditation to ISO 10725 is implemented and awaits auditing.

The industry sponsored membrane oxygenator gets ethical committee clearance for clinical trials.

A field kit is developed for testing antibiotic sensitivity of milk from dairy animals with mastitis.

Epilepsy care services are enhanced with initiation of intra operative electrocorticography and invasive long term monitoring of epilepsy.

Laser treatment programme is established for diseases of the windpipe and spine.

A post-doctoral research fellowship program in super specialties commenced.

Computerization forges ahead with commissioning of a 64K internet leased line and linking of the two wings of the institute.

Silver jubilee of patient care services is celebrated befittingly.



BIOMEDICAL TECHNOLOGY DEVELOPMENT

The demand for medical devices in the country seems to be increasing at rates higher than predicted over the last few years. One major reason for this is the tremendous growth in corporate and private hospitals all over the country and a burgeoning middle class population, who can afford the more expensive treatment modalities. In turn, this is fuelling the growth of the medical device industry in the country, reflected by increasing number of enquiries from industries for collaborative development and testing. Hence, in this context, the implementation of the quality system for its testing services at the BMT Wing seems to have been most opportune and timely.

The Quality system implementation, conforming to the latest standard ISO/IEC 17025 to provide international quality testing services, was completed during this year. A French consultant carried out a pre-assessment audit of the system in May 2001. Based on his recommendations, the systems was improved and fine-tuned. Also, nineteen of our Scientists/Engineers underwent assessors training of NABL and have been qualified. They currently process our application for accreditation to the French agency, COFRAC.



Director Dr. K. Mohandas receives the National Award for development and successful commercialisation of indigenous technology from the Vice-President of India, Sri. Krishna Kant. Also in the picture are Honourable Minister for Science & Technology, Sri. Murali Manohar Joshi, Sri. B.S. Rawat and Dr. RA. Mashelkar.

Some additional infrastructure improvements and restructuring of test facilities were carried out to meet the guidelines of various agencies. The construction of a new sheep house was completed to ensure accommodation as per the new Govt. of India norms.

I. Product Development and Technology Transfer

Membrane Oxygenator and Hemoconcentrator

The development of a hollow fiber membrane oxygenator in collaboration with SPIC, Chennai finally entered the last lap. Batch production of the units in the Technology Proving Facility was carried out and a final series of animal experiments completed. Based on these satisfactory results, clinical evaluation was started in early 2002. Training of industry personnel in the assembly and quality control procedures have been completed and transfer of equipment and fixtures to industry initiated.

The development of a Hemoconcentrator as an extension of the membrane oxygenator work was started and prototypes fabricated. *In-vitro* testing with blood is being organized and the project is expected to be completed during the current year.

Antibiotic Sensitivity of Mastitic Milk –Field Kit for Testing

The Division of Vivarium has developed a novel "FIELD KIT" for testing antibiotic sensitivity of mastitic milk samples in dairy animals. The kit is suitable for use even in remote villages and the results are available in 3 to 20 hours (mean 10 hours). This is against the current 48 hours available from a laboratory accessible in a town or city only. A patent has been filed and the technology transfer procedures initiated.

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., proceeded smoothly. Multi-centric evaluation of these products in selected dental hospitals in the country has been initiated. Training of industry personnel has been completed in all aspects and limited production started.

Fibrin Glue

The scale up and pilot production of the technology for fibrin glue developed by the Thrombosis unit ran into some difficulties in the area of viral inactivation of the products. After trials with different processes, the division has finally standardized on two that give good product stability. The efficacy of each of the viral inactivation process was validated by detection of the tissue culture infectivity dose (TCID50) reduction of spiked model viruses, with the help of Clinical Virology department of CMC Vellore. With the clearance obtained from the Institute's Ethics committee, multi-centre trials at Institutions spread over the country are expected to start very soon. Nearly 100 units of Fibrin Glue kits were produced and quality assured units were supplied to the Neurosurgery department for dura closure.

Hydroxyapatite and Bioglass

Multi-centric clinical trial of large sized porous HAP granules for orthopedic application is progressing at an advanced stage in five centres. Clinical trials of bioactive ceramic composites for various periodontal and related applications were initiated. Toxicological evaluations of self-setting calcium phosphate based bone cements are in progress.

Wound Dressings

Dynamic Orthopedics Pvt. Ltd., Aluva, sponsored the scale-up of Chitosan based wound dressings developed by Biosurface Technology. The programme is on schedule and multi-centre evaluation is expected to start shortly.

The company also sponsored a project for the development of Silver-oxide coated dressings in the Laboratory for Polymer Analysis, which has been completed successfully. Scale-up and clinical evaluation of this product has been planned for this coming year.

Chest Drainage Tubes

An agreement for the licensing of the “Chest Drainage tubes” was signed with SAFEMED of Trivandrum. Though a small technology, it was originally licensed to Penpol, but not commercialized by them. This transfer is to a small-scale industry already involved in the production of chest-drainage collection bottles.

Heparin Coating of Intra-Ocular Lenses

Aurolab, Madurai sponsored a development project for the heparin coating of IOLs during the year. This applied R&D work made reasonable progress; work on improving optical clarity is in progress.

Centrifugal Blood Pump for Heart-Lung Bypass

This project, funded by the DST and being carried out by the Modelling & Prototyping Laboratory made good progress. Working prototypes, giving adequate flow and pressure output, have been developed. Testing for blood damage is being initiated.

Vascular Graft

This is a collaborative project with the South India Textile Research Association, Coimbatore. The grafts fabricated at Coimbatore are cleaned, tested and packaged for clinical use in the Devices Testing Laboratory. Pilot production of 100 vascular grafts in six different sizes for multi-centric clinical evaluation is at an advanced stage. This technology is being transferred to M/s. TTK Healthcare Ltd., Chennai, jointly by the two institutions.

Artificial Heart Valves

A project for the development and testing of three additional sizes of the TTK-Chitra heart valve was taken up at the instance of M/s. TTK Healthcare Ltd., Chennai. The design of the new sizes has been completed and the production of prototypes is being carried out by the industry. The testing and validation of the designs will be completed during the coming year.

Disposable ECG Electrodes

Instrumentation laboratory started work on development of disposable ECG electrodes. Test recordings made using prototype electrodes were found to be qualitatively comparable to those obtained from commercially available imported electrodes. Further work on standardization of materials and processes, as well as development of a test set-up to meet International standards are being carried out.

Electrical impedance spectroscopy for early detection of cervical cancer

A collaborative programme is being initiated for the clinical evaluation of the electrical impedance spectroscopy system developed in UK for the early detection of cervical cancer in women in India. Links

have been established with Tata Memorial Hospital, Mumbai and Department of Medical Physics and Clinical Engineering, University of Sheffield, UK.

An Electrical Impedance Tomography System was transferred from The University of Sheffield to BMT Wing and was installed successfully. The data recorded using this system would be used to develop an artifact free breathing monitor.

2. Testing, Quality System Management and Technical Services

Coronary Stent Evaluation

The biofunctional evaluation of an endovascular stent (Stainless steel coronary stent) at a total cost of Rs.5.8 lakhs for Sahajanand Technoventions Ltd., Surat was completed during the year. Using some of the test data supplied from here, the company obtained the prestigious CE (European union) mark for the product.

Platelet Storage Bags

A detailed evaluation of 3 types of platelet storage bags was carried out for Hindustan Latex Ltd., Trivandrum. The studies focussed on the viability and functionality of platelet storage for 5 days.

Medical Devices Package Validation

A test method for the validation of medical devices packaging based on ASTM F1980-99 was initiated. Two package validation studies – one for the CORONARY STENTS and second for the CHITRA HEART VALVE were taken up and completed.

Calibration Services

The in-house calibration cell developed, validated and introduced 4 new procedures during the year. They were:

Calibration of electronic balances

Calibration of UV-VIS spectrophotometers

Temperature measurement inside closed chambers

Illumination measurement.

Polymer Analysis

The laboratory made extensive efforts to stream line its activities to meet the requirements of ISO 17025 standard for testing services. The service was extended to several external laboratories and almost all the research programmes of the BMT wing availed of it. The laboratory assessed the biodegradability of polymer formulations developed Ravi Industries, Nagpur as a short term programme. The laboratory standardised a gas chromatographic method for the estimation of residual ETO using an internally generated calibration protocol.

Implant Biology

The division now conducts tests for evaluating biomaterials as per ISO 10993 covering cytotoxicity testing in the tissue culture laboratory and gross and histopathological evaluation. Cell-material interaction studies using different continuous cell lines and primary cells were done. About 100 samples were tested for in-vitro cytotoxicity tests as per ISO10993-5. The laboratory actively supported ongoing evaluation and testing of biomaterials and biomedical devices. Gross and histological evaluation of tissue response to materials in biocompatibility testing, end use application studies and pre clinical evaluation of devices like stainless steel vascular stents in pigs and membrane oxygenator in sheep were conducted regularly.

The Transmission Electron Microscopy laboratory, provided service in ultra-structural studies of tissues received from external and internal sources. A study

on immunogold labeling of lipoprotein in ultra thin sections of ovary, gut and fat body tissue was carried out. The ultra structure of raw powder samples of tibia bone, hydroxyapatite, bioactive glass and composite of hydroxyapatite and glass were investigated. Steps are underway to prepare the laboratory for accreditation.

Microbiology

The division provided service for microbiological monitoring of controlled environments, sterility testing, testing of antimicrobial property of materials and bacterial adhesion studies. It also supported Vivarium in the health care monitoring of laboratory animals. Work is ongoing to establish relevant procedures in accordance with ISO 17025 requirements.

Blood Compatibility Testing

In vitro blood compatibility evaluation of DLC-coated titanium/UHMWPE and *in vivo* hemocompatibility of DLC coated Ti discs in sheep models were carried out. Testing of PVC bags from by Hindustan Latex Ltd, Trivandrum, for platelet storage and testing of stainless steel stent submitted by Sahajanand Vascular Technoventions, Surat were completed during the year. Ability of endothelial cells to adhere and grow on these stainless steel stent was evaluated *in vitro* and it was found that the EC adhere, spread and grow on this material to form a monolayer in 72 hours of seeding, indicating good compatibility of the material.

The laboratory participated in the proficiency program conducted by the Royal College of Pathology of Australia for hematology analysis and blood coagulation assays. The results showed that our test results are within the internationally acceptable limits. Uncertainties of all tests that are carried out in the

division for blood compatibility evaluation of biomaterials/devices have been estimated as required by the ISO 17025 standard.

Quality Cell

Formal application for accreditation of testing laboratories was made to COFRAC, the French laboratory accreditation body in April 2001 and additional information as required was filed in September 2001. A French consultant on quality systems carried out a pre-audit from 28th May to 1st June 2001. He visited the various laboratories and carried out an assessment of the quality system implemented and preparedness for final audit and provided detailed feedback on the shortcomings.

Improvements to the quality system were continuously made by appropriate corrective and preventive actions. Regular quality meetings and training programs were held to reinforce the quality mindset. Periodic reviews of quality system documents were carried out resulting in the revision of the Quality manual and entire system documents. The Quality cell also carried out the reissue of about 200 documents revised by the various laboratories.

A Technical Management Committee was constituted in October 2001 to review the quality objectives and internal quality measurement reports of the laboratories. Planned internal audits of the laboratories were conducted during October 2001 and March 2002 to verify compliance with the quality system requirements. The Management Review Committee for quality system met during December 2001 to review the findings of the internal audit and quality system implementation.

Training on general metrology, calibration and measurement uncertainty was held on 17-18 May

2001. Training programs for awareness and appreciation of ISO 17025 quality standard and internal auditing was organized from 12th to 14th August 2001 with the help of external experts.

Nineteen of our Scientists / Engineers attended the Laboratory Assessors course organized by National Accreditation Board for Testing and calibration Laboratories (NABL) and all have been empanelled after passing the tests.

Customer Services

The customer service cell (CSC) handled all the test requests from both internal and external customers and provided a single window service to the customers for their testing requirements. The requests for testing services increased significantly and about 500 test requests were received during the year, of which about 40% were from external customers. Requests from medical device industries for evaluation of their products were also received. The operations of the customer services cell were streamlined and every effort was made to provide necessary assistance to the customers in proper selection of tests. Feedback collected from customers indicated a good degree of satisfaction with the testing services. Customer complaints were promptly handled, which were minimal.

Intellectual Property Rights

Technical co-ordination cell handled the Intellectual Property Rights of the Institute, particularly related to the patent applications presented by the scientists. The Cell coordinated these patent applications with its patent attorneys. In view of the new upcoming IPR regime some applications needed special drafting in order to gain the maximum patent term of 20 years for Product patents. Our applications being related

to health care, tends to be classified as drug and hence restricted to 7 years, unless special care in drafting and filing is carried out.

In view of the considerable increase in renewal fees, efforts are on for periodical review and commercialization of the granted patents. Fresh Patent applications are being primarily considered from the commercial viability point of view.

During the year under review, 5 new patent applications were filed and 5 of our earlier applications have been granted. The current status of the Institute's patents and designs is as follows:

Patents held (sealed)	= 42 Nos.
Patents filed and pending	= 44 Nos.
Designs held (sealed)	= 13 Nos.

This Cell also handled the visits of academicians to the BMT Wing and the science exhibitions of the Institute's technology achievements. The institute participated in the SWADESHI VIJNANA Mela held at Cochin Jan 12-19, 2002. The cell also participated in the SWADESHI MELA during May 16 - 22, 2001 held at Cochin, on behalf of TDB.

Engineering Services

Fabrication of fixtures and machining of components for various programmes of the Institute were supported by this division. The notable ones were:

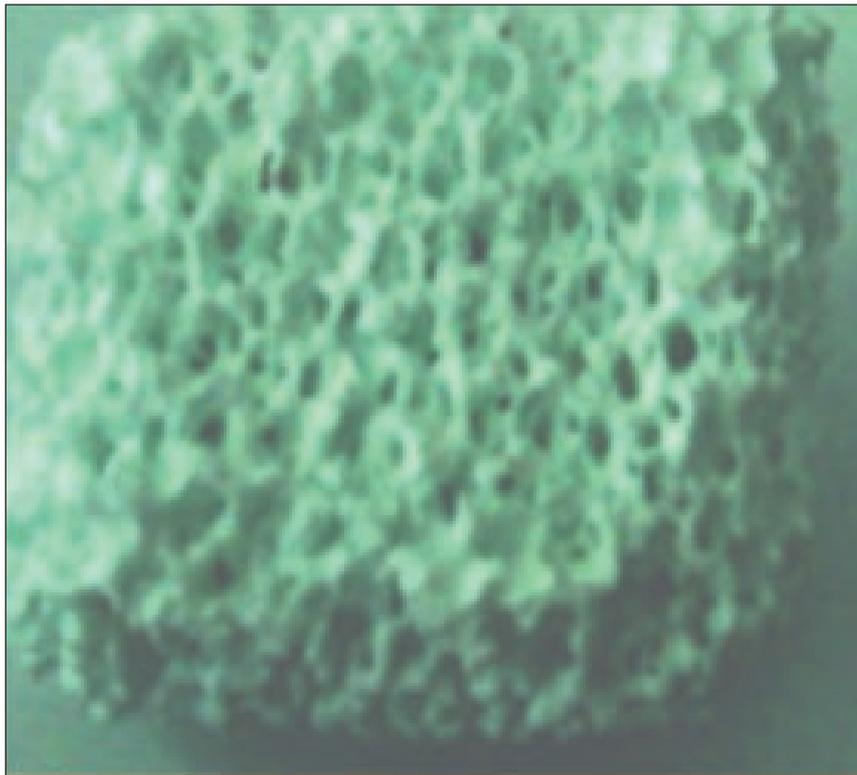
140 sets of artificial limb components were machined and supplied to M/s. Dynamic Orthopedics Pvt. Ltd. Machining of blood pump impellers and extension of support facility for machining various components related to membrane oxygenator and Blood Pump project.

Design and fabrication of a Die & Punch assembly for chest drainage tube fabrication and preparation of test sample for Polymer Processing lab

Design and fabrication of one electrode assembly for Cellular and Molecular Cardiology unit of hospital wing.

Machining of Sample Holder for X-ray Defractometer, Lyophiliser Jars, etc to various laboratories.

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



Porous hydroxy apatite ceramics with interconnecting porosity

PATENTS GRANTED

- 1) US Patent sealed: Process for the preparation of an immunoadsorbent matrix**
Inventors: Chandra P. Sharma, P.R. Hari and Willi Paul
Patent No. US 6,309,999 B1 dated 30-10-2001.
- 2) A process for the preparation of calcium caseinate beads containing any oral drug**
Inventors: A. Jayakrishnan and M.S. Latha
Indian Patent No. 181854 dated 24-06-1996.
- 3) Double umbrella occluder device for cardiovascular applications**
Inventors: K. Ravi Mandalam and A. Jayakrishnan
Indian Patent No. 184338 dated 05-07-1995.
- 4) A Method for preparation of biostable polyurethane**
Inventor: M.Jayabalan
Indian Patent No.182366 dated 06-02-1995.
- 5) A process for preparation of fibrin glue**
Inventor: Lissy K.Krishnan
Indian Patent, 365/MAS/98 dated 24-02-1998

RESEARCH ACTIVITIES

Biomaterials Research and Development

Collaborative Projects

The Indo-French collaborative project, “Development of Diamond like coatings for medical and other applications” was completed as per schedule in August 2001. The results indicated the good blood compatibility of the DLC coatings developed in France. Initiation of the second phase of this project involving the transfer of the coating equipment to an industry in India has not been successful so far.

The NMITLI Project funded by CSIR for the development of oral delivery of insulin made good progress with some interesting results. Further work is in progress. The objective of this study is to use calcium alginate as a matrix to deliver insulin orally in the gastrointestinal tract. If successful, this will make a major impact in the treatment of diabetes mellitus, the incidence of which is continually increasing and approaching epidemic proportions. The project is being carried out in collaboration with NCL, Pune and the industry.

The Bioceramics laboratory is involved in the area of biomimetic processing of bioactive composites in collaboration with National Institute of Advanced Industrial Science and Technology, Nagoya, Japan. A new method has been developed to functionalise synthetic polymers such as polymethyl methacrylate (PMMA) or polyvinyl acetate (PVA) so as to achieve in vitro growth of calcium phosphates over their surface when immersed in simulated body fluids. The material is expected to find use in the areas like guided tissue regeneration and biodegradable implants.

A new 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” was started under the auspices of DST-DAAD academic exchange services-2001. The objective of this project is to fabricate three-dimensional contours of HAP-EVA composites using special thermoforming techniques available at Institute for Composites Materials, University of Kaiserslautern, Germany.

Bioceramics

Calcium phosphate based self-setting bone cement has been developed and the setting parameters optimized. The aim is to make a new class of osteo-conductive

cements. These can be used in the form of injectable paste, which will avoid major surgical intervention involved in bone filling. The basic formulation contain a dry mix of calcium phosphate compounds which, on wetting with an aqueous medium, undergo self-setting reaction to give a hard, porous apatitic mass. Currently the *in vitro* biocompatibility testing is in progress.

Biosurface Technology

Preparation of a matrix for sublingual delivery of insulin is also being experimented with. Procedures are being optimized for insulin loading using ELISA and *in vitro* release studies. *In vivo* experiments have shown very promising results.

In continuation of the previous DBT project on Hemoperfusion column, an attempt was made to reduce white blood cell (WBC) adhesion by modifying the surface with diamino polyethylene glycol (DPEG), phenylalanine and heparin on the polyvinyl alcohol microspheres. The WBC adhesion was reduced significantly upto 50%. As an alternate, attempt was also made to couple phenylalanine onto cellulose films. WBC and RBC adhesion was significantly reduced with the enhancement of IgG adsorption. Further work is in progress.

Dental Products

A DST funded project (fast track programme for young scientist (Dr. Lizymol) for the development of organically modified ceramics (ORMOCERS) was started during the year. This approach is expected to result in new composites with superior mechanical properties, especially wear resistance.

Hydroxyapatite was tried as a potential filler material in dental composites with a view to enhance the

adhesion to the tooth. Two paste composite formulations were prepared using BIS- GMA resin matrix and quartz/ HAP combinations as filler. Effect of HAP content and catalyst/ accelerator ratio on properties of the composite was monitored.

Polymer Analysis

Methodologies were developed to functionalise the surfaces of polymers such as PMMA and PVA with phosphates groups. Such modified materials were found to encourage the growth of hydroxy apatite on their surfaces when placed in stimulated body fluids.

The deterioration of the mechanical properties of silver coated latex catheters when aged in synthetic urine was traced to the conditions of the coating process. The process was modified and improved so that the coating could be done at lower temperatures. A simple spraying technique to incorporate silver oxide on the surface of different polymeric matrices was also attempted.

Chitosan was chemically modified using monomers such as vinyl acetate, HEMA etc. with a view to develop matrices for novel applications. Procedures have been standardised to isolate hyaluronic acid and collagen from different animal tissues.

Polymer Chemistry

Work on a rapidly gelling polymer system based on gelatin and alginate dialdehyde is being continued with the aim of using the system as a possible wound dressing material. The work has made substantial progress and the material is presently undergoing animal evaluation. Antibacterial agents such as silver sulphadiazine and gentamycin were incorporated into the polymer scaffolds and their release properties were studied *in vitro*. Synthesis, characterization and

polymerization of a new iodine-containing vinyl monomer to prepare polymers with radio-contrast properties was completed.

Azide-containing polymers and copolymers from p-azido benzoic acid and epichlorohydrin azide prepared by synthesizing vinyl monomers from these compounds and polymerizing and copolymerizing them with other vinyl monomers such as methyl methacrylate have been extensively characterized. They were then tested for their antibacterial properties against certain strains of bacteria. Although azidated poly(vinyl chloride) exhibited good antibacterial properties, these polymers synthesized with a view of using them as antibacterial polymers in a more precise manner were not found to resist the adhesion and colonization of bacteria. The precise reason for this anomaly is not known. In continuation of this line of work with polymers with antibacterial properties, monomers such as 2-azidoethyl methacrylate and 2-thiocyanatoethyl methacrylate were synthesized from 2-hydroxyethyl methacrylate for the first time. The monomers were purified and characterized. Unfortunately these monomers were not found to undergo homopolymerization and copolymerization by the free radical pathway for reasons not known at present.

Polymer Division

Development of biodegradable bone fixation materials was explored. In repair of bone in orthopaedic surgery, bone stabilization and bone healing are the important aspects for the success of the surgery. Metal plates and screws are presently used in the operative treatment of bone fracture to stabilize the fracture; but these prevent primary callus formation due to the absence of mechanical stimulation at the fracture site and decrease bone density. Hence, surgical removal

of metal plates and screws after they have served their stabilisation function is now required, resulting in a second operation. Polymeric bone plates, which exert less stress protection and allow flexible fixation of fracture are of increasing interest. Further, biodegradable polymeric composites can go further and avoid the second surgical intervention for removal and are therefore of great interest.

Earlier, poly(propylene fumarate) oligomers and poly(propylene fumarate-caprolactone diol) copolymer for the use as biodegradable and injectable polymer for orthopaedic surgery were synthesised. Composites using poly(propylene fumarate-caprolactone diol) resin, n-vinyl pyrrolidone comonomer, kevlar fiber and hydroxy apatite fillers have been prepared as potential bone plate and screw materials. Further studies to determine their degradation profiles, products and other properties are under progress.

Polymer Processing Laboratory

The DST funded research project on hydroxyapatite (HAP) – ethylene vinyl acetate co-polymer (EVA) composites for bone substitute applications made good progress during the year with encouraging results from animal studies. The material passed in vitro cytotoxicity and in vivo tests. Selected compositions were implanted in rabbit's cranium and the response has been studied at different time periods by histopathology.

As part of another project for the development of non-toxic latex formulations, over a dozen brands of locally available gloves were evaluated for cytotoxicity. Various methods to reduce toxicity of latex formulation are in progress. A method for the determination of latex protein was standardized as per ASTM method.

Biological Research and Evaluation

Implant biology

Studies on biomineralisation process were conducted with Hydroxyapatite, Bioactive glass and their composites using rat calvarial osteoblast cells. In vitro results obtained were in agreement with already generated in vivo data of these materials. The biological response to certain polymeric biomaterials was studied using in vitro culture systems of hepatocytes. Primary hepatocytes were isolated and maintained in a two dimensional matrix. Viability of cells grown on different matrices using biochemical and molecular biology techniques are in progress. Cells grown on thermo-sensitive polymer coated tissue culture dishes gave encouraging results. Attempts to develop a co-culture system of hepatocytes and endothelial cells useful for tissue engineering scaffolds are ongoing.

Cytotoxicity screening of different latex formulations of commercially available gloves and their ingredients like rubber accelerators, was initiated (self setting bioactive composite bone cements). General and specific cytotoxicity screening of different formulations (in house) using fibroblast and osteoblast cells was initiated.

Work was initiated on evaluation of retrieved human implants, which included light and scanning electron microscopy observations on tissues and implant material. Biological response of tissues to Ultra High Molecular Weight Polyethylene, Ethylene Vinyl acetate- Hydroxyapatite copolymer, Stainless steel and Diamond like carbon coated titanium. Biological response of bone to HABG composite granules, EVAHAP composites in cranium was assessed in rabbits.

Research was initiated on molecular mechanisms of tissue response to implant debris. Cellular and molecular mechanisms of polymer degradation' and the effect of renal osteodystrophy and its impact on bone healing: normal and with metal prosthesis in an animal model are being studied.

Transmission electron microscopy work continues on ceramic implants in bone.

Molecular Medicine

Systemic administration of pilocarpine produces many of the clinical features of human temporal lobe epilepsy and status epilepticus in rats, including the induction of motor convulsions and the degeneration of neurons in the hippocampus. Using this model, early changes in gene expression during seizure development were identified. Differential display PCR was used to identify mRNAs that are differentially expressed between control, epileptic and post-epileptic hippocampal tissues in the brain after pilocarpine-induced seizure activity. A novel cDNA fragment expressed in hippocampus was identified, cloned, and sequenced. This novel cDNA fragment is a member of the kininogen gene family that is rapidly and transiently induced in response to seizure activity. Differential expression of this gene was confirmed by Northern blot analysis. This inducible gene may provide a direct link between seizure-induced neuronal gene expression and subsequent degeneration of neurons.

Besides the transcriptional variation, neurons also show translational down regulation of few selected genes. For instance, we found that glycogen branching enzyme level in hippocampal tissue reduces to 50% within first few hours seizure and did not recover to control level even after 8 hours of seizure free period in rat model. In human epileptic hippocampus this

protein showed marked reduction compare to control. This finding has considerable significance since it may be one of the reasons for development of mesial temporal sclerosis in human temporal lobe epilepsy. In addition to the above, the division has initiated a new study to identify brain mRNAs binding to Jerky, a protein deficient in an epilepsy model. This will allow us to perceive pathways involved in hyperactivation of neurons.

Thrombosis Research

A DST funded project for tissue engineering of vascular grafts was initiated. The objective is to culture a layer of endothelial cells on the inside of small diameter vascular grafts to make them more blood compatible.

An ELISA was standardized using in-house developed antibodies to detect the plasma level a -granule proteins released from platelets on activation. The test was validated to be suitable to measure the platelet activation during storage of platelets as concentrates for transfusion and in clinical plasma samples obtained from patients with cardiovascular disease. A study in collaboration with Cardiology department to evaluate the platelet function in aspirin treated patients was completed.

In collaboration with the institute's Blood Bank, ATP levels in whole blood samples were measured in order to identify the storage problems. Platelet shape change measurements were conducted to correlate swirling

as a quality control measure of stored platelets for transfusion.

Toxicology Evaluation and Small Animal House

Division of Toxicology carried out the toxicity and safety evaluation of various candidate biomaterials and end products during. Various tests like haemolysis, acute systemic toxicity, irritation tests, intra muscular implantation, sub-cutaneous implantation, oral toxicity and sensitization were carried out for the safety evaluation of various materials that are used in the fabrication of Medical Devices. Rabbit pyrogen test and sterility were the tests carried out on devices.

Facilities and procedures for water analysis were established. Internal training for the support staff in the animal house was conducted. a Laboratory facilities were extended to Mrs Usha, Lecturer, Sasthamkotta college and Mrs Geetha, Research fellow, TBGRI to carry out part of their Ph.D work.

Vivarium

The construction of a new sheep house was completed with raised slatted roof, meeting the INSA as well as CPCSEA requirements for sheep housing. Ex-vivo evaluation of Membrane Oxygenator in a sheep model and the pre-clinical evaluation of an endovascular stent in a pig model were completed. Evaluation of HAP-polymer composites for cranioplasty application in rabbit model is ongoing.

Clinical Research

Division of Biochemistry

Coconut oil and incidence of coronary artery disease in Kerala

Coconut oil with its high content of saturated fat has been in the eye of a storm of controversy. In order to look into any possible correlation between hypercholesterolemia and intake of coconut oil, we have made an elaborate study of the dietary habits and clinical history of 550 patients with coronary heart disease (CAD) and 450 controls. The data collected on the type of fat intake and the serum levels of lipids and lipoproteins and fatty acids from CAD patients and controls, is being subjected to further analysis to arrive at meaningful conclusions, which would be of interest to both the public and the clinicians.

Lp (a) and its relationship to coronary artery disease

Recently Lp (a) is emerging as an important cardiovascular risk factor. Lp (a) is a lowdensity lipoprotein (LDL)-like particle containing in addition to LDL a specific glycoprotein called apo (a), which is structurally homologous to plasminogen. Lp (a) is unique among lipoprotein in its high content of O-glycosylation. Increased plasma levels of Lp (a) have been reported to be an independent risk factor for coronary artery disease (CAD), stroke and peripheral vascular disease. The striking homology between Lp (a) and plasminogen has given rise to the hypothesis that increased rate of premature atherosclerotic and thrombotic diseases associated with elevated levels of Lp (a) arises by competition with plasminogen for its receptors present on a variety of cells in the arterial wall. This would shift the equilibrium to favour thrombotic events rather than fibrinolysis. Further, by its great affinity to apo-B- containing lipoproteins and fibrin it could deliver lipids to the site of vascular damage. However the exact function of Lp (a) in lipid transport, its role in CAD and the factors that regulate its synthesis or clearance remain poorly understood. We have initiated a detailed investigation to address the above issues by using human Lp (a) isolated from blood by ultracentrifugation. In preliminary trials we observed that heart galectin-1 could sugar- specifically bind to immobilized Lp (a).

Pathophysiology of carbohydrate- binding antibodies

In glycobiology, pathological significance of carbohydrate-dependent biological recognition is underlined by recent reports of sugar-specific proteins (lectins) on

tissues and of sugar-binding antibodies (with autoantibody potential) in serum, from laboratories including ours. Thus cardiovascular consequences of immune complexes getting sugar-specifically recognized by endothelial lectins as well as autoimmune effects of serum antibodies binding to carbohydrate antigenic epitopes in the brain and deep muscle tissues are actively pursued research areas in the division.

A naturally occurring antibody (DIg), first detected in this laboratory and characterized by a strong affinity of its binding site for bacterial glucans like dextran, was demonstrated to display multiple carbohydrate binding specificities. Bacterial glucans as well as terminal α -linked galactose units could occupy its binding site as antigenic epitopes, suggesting the anti-microbial and anti-tumor roles of DIg in the body. Significantly, 50% inhibition of DIg activity was possible at 16 mM glucose. In diabetes, blood glucose exceeds this concentration, unlike in normoglycemic persons. Thus a check on defensive functions of this antibody by high blood sugar may explain the high susceptibility of diabetics to infections and tumors.

Department of Cardiology

The following research projects are being carried out in the department.

1. Long term results of coil occlusion of patent ductus arteriosus
2. Influence of Troponin-T and C reactive protein (CRP) levels in clinical outcome in patients with unstable angina.
3. TEI index as a marker of left ventricular function
4. Role of amiodarone in rhythm control in patients with atrial fibrillation
5. Coronary venous anatomy in patients undergoing coronary angiography
6. Nicotinic acid as an added on therapy with statins in patients with low HDL levels
7. Effect of Clopidogrel in patients with acute myocardial infarction
8. Long term follow up in patients with ASD after Amplatzer septal occluder device closure.
9. Coarctation of aorta – Surgical versus balloon dilatation – Long term follow up.
10. Pain paring in unstable angina – Randomized study evaluating ischemia burden.
11. Atrial septal defect with severe pulmonary hypertension – Long-term follow up after surgery.
12. Trans esophageal echocardiography in assessment of patients with stroke (study in collaboration with Dept. of Neurology).

Department of Cardiovascular and Thoracic Surgery

Clinical trial of cardiovascular devices

The clinical trial of Chitra Membrane Oxygenator was started at the Institute. In a few months the trial is expected to be completed and a multi-centric trial is to be initiated after that.

The clinical trial of Chitra vascular graft was successfully completed in our Institute.

Division of Cellular and Molecular Cardiology

The division continued its research programs initiated during the last year and made significant strides in understanding the basis of cardiac injury and response to injury in magnesium deficiency. A noteworthy

achievement was the standardization of methods for successful isolation of endocardial endothelial cells from ventricles of porcine hearts.

Modulation of myocardial contraction by sub-optimal levels of extra cellular magnesium in free radical stress

Marginal magnesium deficiency is prevalent in regions with soft water such as Kerala. Magnesium deficiency reduces the threshold for stress tolerance. Excessive free radical generation accompanies physiological and pathological stress. The project is aimed at examining the synergistic action of magnesium deficiency and free radical stress on myocardial contractility. The mechanism underlying the inotropic changes is to be delineated.

Synergistic action of magnesium deficiency and free radicals on the myocardium

Excessive free radical generation is associated with physiological stress and disease states; Reduced tolerance to stress is a characteristic feature of Mg deficiency. Experimental studies were carried out in isolated rat papillary muscle to examine the inotropic response to free radical stress in conjunction with Mg deficiency. The negative inotropic response induced by free radicals was augmented by a marginal decrease in extra cellular magnesium. Age of adult rats was found to have a significant influence on the contractile response of myocytes to variation in extra cellular magnesium. Though the amplitude of contraction was directly proportional to age, young adults were more sensitive to changes in magnesium. The age dependent variation in response is probably mediated by calcium influx through voltage gated calcium channels and Na-Ca exchanges. Work is also in progress to examine the role of oxygen radicals in

the induction of cardiomyocyte hypertrophy.

Vitamin D and its relationship to coronary artery disease in the tropics

This project, which is funded by Board of Research in Nuclear Sciences, is undertaken with aim of testing the hypothesis that elevated serum level of Vitamin D3 is a risk factor for coronary artery disease. Specific objectives of the project includes (a) measuring serum levels of Calcidiol, Calcitriol, Parathyroid hormone, calcium and magnesium in patients with angiographic evidence of coronary artery disease and controls and (b) comparing the mean levels of variables in cases and controls using Student's test and to observe degree of association between variables using the Pearson's correlation coefficient. (c) Examining the relative odds of coronary artery disease associated with high serum levels of Calcidiol and Calcitriol.

Employing a case-control study design, blood samples from 150 men with angiographic evidence of coronary artery disease were collected. Blood samples from another 150 age group matched men with no clinical symptoms or history of coronary artery disease served as controls. Serum levels of Calcidiol, Calcitriol, and Parathyroid hormone were assayed in duplicates using commercially available Radio Immune assay kits. Calcium and Magnesium were also assayed using spectrophotometric methods.

Serum levels of these biochemical parameters were found to be well within the normal range except for calcitriol. Interim results of the project are as follows. Calcitriol was found to be 133.12 pmol/L in controls & 121.41 pmol/L in cases, which was above the normal range. (48.0 – 111.0 pmol/L). Calcidiol was found to be 64.32 nmol/L in controls & 55.91 nmol/L in cases (normal range 23.0 – 113.0 nmol/L). A

parathyroid hormone level was found to be 2.21 pmol/L in controls & 1.47 pmol/L in cases (normal range 0.8 – 5.2 pmol/L). Calcium was found to be 2.28 mmol/L in controls & 2.33 in cases & magnesium were 1.07mmol/L in controls & 1.19 mmol/L in cases (normal range 0.7 – 1.1 mmol/L).

Molecular mechanisms in cardiac fibrosis

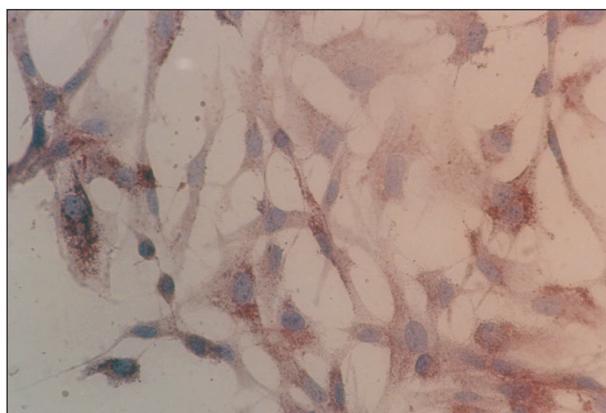
Cardiac fibroblasts, as the major cellular constituent of the interstitium, play an important role in maintaining the structural and functional integrity of the myocardium. Mechanisms underlying modulation of cardiac fibroblast activity are, however, poorly understood. Studies carried out in this laboratory showed that the neuropeptide, substance P, is mitogenic to cardiac fibroblasts by an oxygen free radical-mediated mechanism that involves alterations in calcium influx. As substance P is released from peptidergic nerves in the myocardium during ischemia, a study was initiated to test the hypothesis that the neuropeptide may play a role in initiating post-infarct ventricular remodeling.

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

The proposed study is conceived as a sequel to earlier investigations and would test the hypothesis that substance P may be a factor in the regulation of cardiac fibroblast activity during ischemia. Hypoxia-induced alterations in the expression of genes encoding matrix proteins and the phospholipase C -signaling cascade in cardiac fibroblasts will be examined. Involvement of substance P in the response of cardiac fibroblasts to hypoxia will also be studied. The investigations are expected to yield insights into mechanisms of wound healing in the heart following myocardial infarction.

Molecular basis of endomyocardial fibrosis

Endomyocardial fibrosis is prevalent in areas whose geology is characterized by the presence of black sands containing cerium. The study aims to test the hypothesis that cerium activates cardiac endothelial cells to produce factors that cause enhanced fibroblast proliferation resulting in endomyocardial fibrosis.



Endocardial endothelial cells in culture, stained with antibodies to factor VIII

Cultures of cardiac endothelial cells were set up to test for signs of activation by causal factors of endomyocardial fibrosis. Porcine heart ventricles were filled with collagenase solution, incubated, cell suspension collected and centrifuged. The resuspended pellet was plated, cells grown to confluence and passaged. Work is in progress to test the effects of various factors causing endothelial activation.

Division of Microbiology

Anti viral and anti fungal studies on some indigenous medicinal plants of Western Ghats

The aim of the study is to look for antiviral and antifungal activities of selected medicinal plants from the Western Ghats. Aqueous, alcohol and N-hexane

extracts of the plants were tested against enteroviruses such as Cocksackie B and Polioviruses. Having screened about six plant extracts promising results were obtained from two extracts showing antiviral activity at a low concentration of 50 microgram/ml and no cell cytotoxicity up to 1 miligram level.

Identification and characterization of protective antigens of Mycobacterium tuberculosis with the potential benefits of identifying antigens as vaccine candidate and as reagents for immunodiagnostic tests

During the year the division, successfully established a simple, rapid, inexpensive, sensitive, reproducible, method for the direct demonstration of mycobacterial antigen in the cerebrospinal fluid (CSF) specimens of patients with tuberculous meningitis (TBM). This immunocytochemical method for the demonstration of mycobacterial antigen can be applied for the early laboratory diagnosis of TBM, particularly in those patients in whom bacteriological method do not demonstrate the presence of *M tuberculosis* in the CSF specimens. The technique also does not require elaborate instrumentation or technical expertise.

Department of Neurology

Epilepsy research

The study, 'Phenotypic, genotypic and socio-economic characterization of a population based sample of persons with epilepsy' funded by JNCASR, Bangalore and the Indian Epilepsy Association is in progress. These patients were identified from a population of about 250,000 from a survey conducted earlier.

A case-control study on epilepsy, funded by the Indian Epilepsy Association, is being undertaken in the epidemiological sample of epilepsy patients distributed in 10 Panchayats in mid-kerala.

The Kerala Registry of Epilepsy and Pregnancy has been coordinating the activities of other registries at a national level. Our registry is also collaborating with The European Registry of Epilepsy & Pregnancy.

A study evaluating the utility of sphenoidal electrodes in long-term epilepsy monitoring is in progress.

Stroke research

1. Evaluation of aphasia in stroke and establishing a clinico-radiological correlation of aphasia.
2. Stroke in the young-a case control study.

Cognitive and Behavioural Neurology

Urban dementia survey: The fund for the survey was granted by Sri. Ratan Tata Trust (Mumbai). Preliminaries of an epidemiological study of prevalence of dementia in the elderly in an urban area in Kerala were completed, bringing Phase-I of the study to completion.

Collaborative efforts with the Alzheimer's & Related Disorders Society of India (ARDSI), Trivandrum Chapter, resulted in the commencement of a Day care center for dementia in Trivandrum on 21st September, 2001. Technical advice to this center is provided by CBNC.

A study on aphasia individualising its anatomic correlation was commenced in collaboration with the Stroke section and Dept. of Radiology.

A programme on clinical psychology was commenced. Standardization of some neuropsychological tests was also taken up.

Neuropsychological tests were standardized including MMSE and ACE.

Translation, transcription and standardization of instrumental activity of daily living scale for elderly in developing countries was completed.

Data collection of the newly designed semantic battery was commenced

Department of Neurosurgery

The following studies were carried out in the department:

1. Role of mucoid vasculopathy in the etiopathogenesis of cerebral aneurysms
2. Comparison of spiral CT angiography and conventional angiography in the diagnosis of intracranial vascular lesions
3. Corrosion casts of cerebral vessels
4. Creating Three D images of cerebrovascular system and its anomalies

The various collaborative programs were:

1. ***p 53 gene mutations in gliomas*** in collaboration with Rajiv Gandhi Institute of Biotechnology Trivandrum.
2. ***STICH trial***: The department is one of the Indian centers selected for the multicentric international STICH trial (Surgical trial in intracerebral hemorrhage) jointly conducted by the stroke association and the Medical Research Council of United Kingdom with Prof. Mendelow of Newcastle General Hospital, England as the Principal investigator.
3. ***Fibrin glue***. The clinical trial in the institute is completed and is now part of a national multicentric trial.

Division of Pathology

Role of cytokines in the pathogenesis of Gillaine-Barre syndrome

Gillian Barre Syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy. The disease is immunologically mediated. The immune factors such as cytokine (tumour necrosis factor-alpha) are known to cause demyelination. To investigate the role of cytokine in patients with GBS, the serum cytokine were measured by sandwich ELISA, before, during and after plasma exchange and intravenous immunoglobulin therapy. 60% GBS patient showed elevated TNF-alpha levels (60-182 pg/ml) and in these patients, there was a gradual decrease in the TNF- alpha following plasma exchange and IVIg therapy. The decrease in the TNF- alpha level also showed a good correlation with the neurological recovery. The results in this study so far convey that elevated TNF-alpha levels occur in GBS and they decrease following PE.

Department of Radiology

Detection and treatment of cancer using laser based techniques

The Project has been sanctioned by Dept. of Atomic Energy, BRNS, Government of India. The duration of the project is 3 years. The project emphasizes on the early diagnosis of cancers by studying fluorescence radiation from the normal and diseased tissues. Studies on characterization of atherosclerosis are also a part of the project.

HEALTH SCIENCE STUDIES

Achutha Menon Centre for Health Science Studies (AMCHSS) continued its unique activities in the year 2001-02. World Health Organization decided to support the Master of Public Health (MPH) candidates sponsored by the Ministry of health and Family welfare, Government of India under the WHO fellowship program. Eight candidates joined for the MPH program under this fellowship on January 1, 2002. In addition another five students joined from the open category making a total of 13 students for the MPH program. During this year eight candidates completed MPH degree. Two more faculty members joined the centre making the total faculty strength to 9. This will enable the centre to take more number of students for the MPH program.

A new initiative was the launching of Athiyannoor Sree Chitra Action (ASA), a community owned health and development initiative. Athiyannoor block Panchayath has a population of 200000 and is within half an hour drive from the institute. The local self-government is willing to own and operate a comprehensive health and development program in this Panchayath. The objective of this initiative is to empower the community to take up health and development initiatives by optimising the available resources and raising local resources when necessary. A committee



Participants of the workshop for state and district health officers from Gujarat



Visitors from University of Minnesota



Director Dr. Mohandas speaking at the Workshop on Health Policy
Health Minister Sri. P. Sankaran inaugurated the workshop
on National, State and Tribal health policy

with the block Panchayath president as chairperson will plan activities in the area. Technical support will be provided from the institute.

Research activities related to thirteen externally funded projects continued in this year. The World Health Organization, the Rockefeller Foundation, Ford Foundation, MacArthur Foundation, European

Commission, Government of Kerala, Kerala Research Program for Local Level Development and 'CHANGE' Washington supported the research projects. The research projects address issues like networking of public health institutions in developing countries, poverty and gender dimensions of Tuberculosis in South East Asia region, Surveillance of cardiovascular diseases in Indian Industrial population,

commissioning of research grants to individuals and institutions in India in reproductive health and gender, enhancing research capacity of non-governmental organizations in India, a situational analysis of medical termination of pregnancy in India, political decentralization and status of reproductive health in Kerala, current status of reproductive and child health services in Kerala, health manpower in Kerala, Strengthening primary health centres through panchayathi raj institutions and idle capacity of government hospitals in Kerala.

Status of ongoing/routine activities

Eight students (including one international student) of the 2000-2001 batch successfully completed the MPH programme. A list of dissertations is included. Currently another batch of 8 students (2001-2002 batch) are working towards completion of their dissertations. From January 2002 a new batch of 13 students joined the course at the AMCHSS. Eight students enrolled during the academic year receive financial assistance from WHO through a fellowship programme.

Dissertations submitted in June 2001:

Sl. No.	Name of the student	Topic
1.	Md. Shafiul Islam	Knowledge, attitude and treatment practice about hypertension among health care providers of Bangladesh.
2.	Joe Varghese	Influences of provincial guidelines to assessment of local health needs on resource allocation and programme implementation of decentralised local self-governments in Kerala, India.
3.	Roy N.	Prevalence, risk factors, treatment practices and direct cost of acute respiratory infections (ARI) among children under five years of age in rural Trivandrum district.
4.	Betty Susan Ninan	Determinants of treatment non-compliance among pulmonary TB patients in RNTCP-DOTS, Trivandrum, Kerala, India
5.	Biju Gopinath	Prevalence and correlates of dental caries and the assessment of dental treatment needs in school going children of standard eight in Trivandrum city.
6.	Saiju Hameed	Rationality pattern and determinants of prescribing behaviour among modern medicine practitioners of Thiruvananthapuram district, Kerala.
6.	Saiju Hameed	Rationality pattern and determinants of prescribing behaviour among modern medicine practitioners of Thiruvananthapuram district, Kerala.

Sl. No.	Name of the student	Topic
7.	Deepa Mathew	Burden of self reported morbidity and its correlates among people above the age of forty five years: A community based survey in rural Kerala.
8.	Deepa Mathew	Burden of self reported morbidity and its correlates among people above the age of forty five years: A community based survey in rural Kerala.
9.	K. Hemachandran	Burden, cause and cost of cesarean sections: A community based study in the three city corporations of Thiruvananthapuram, Kochi and Kozhikode, Kerala.

PATIENT CARE

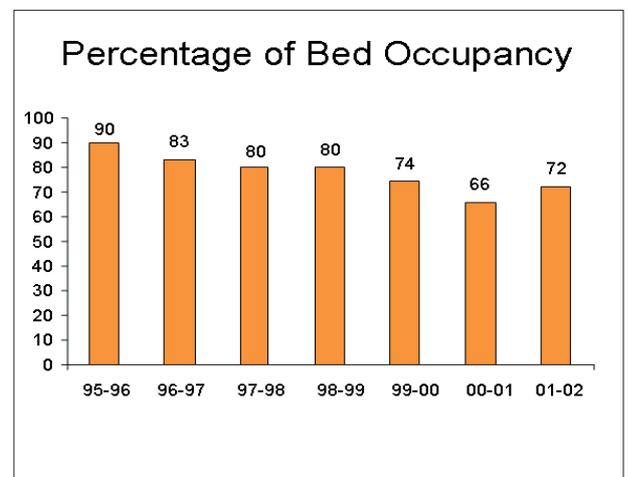
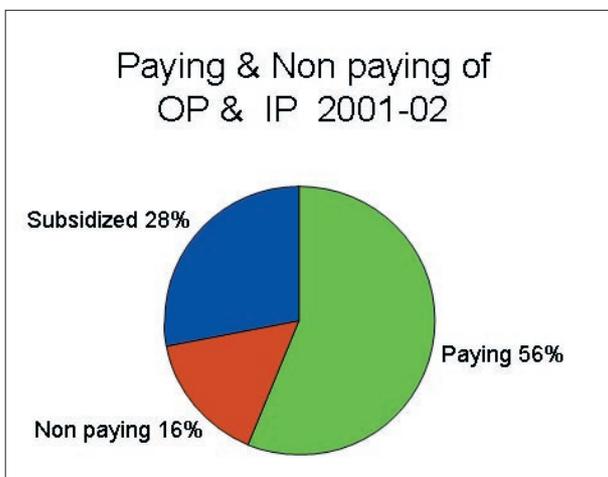
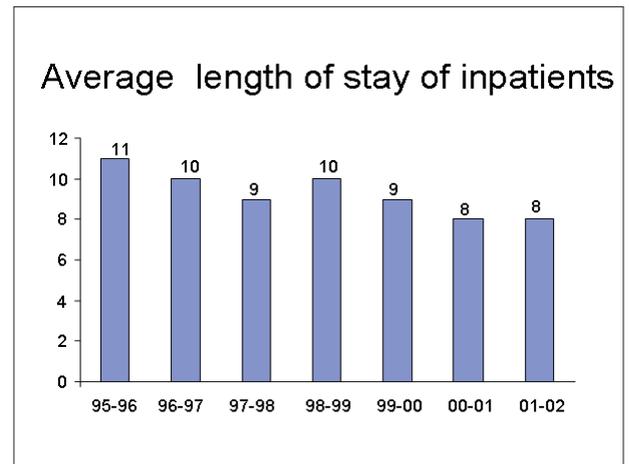
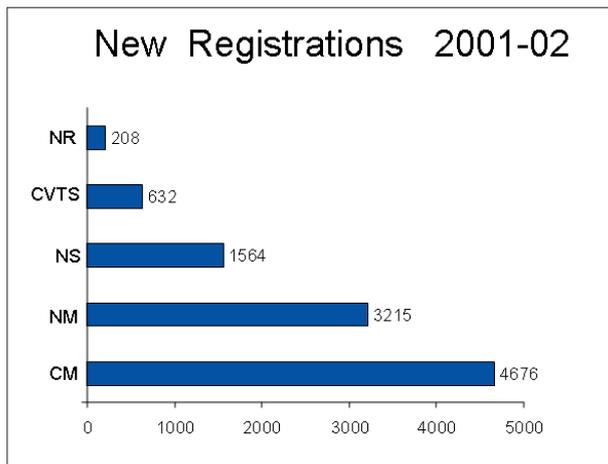
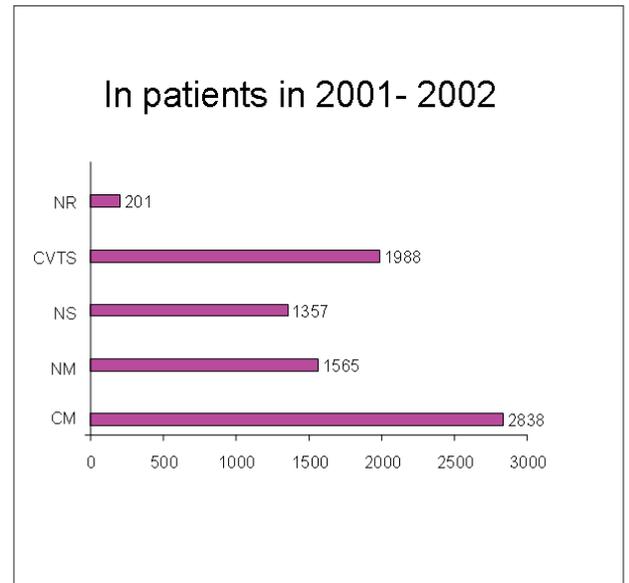
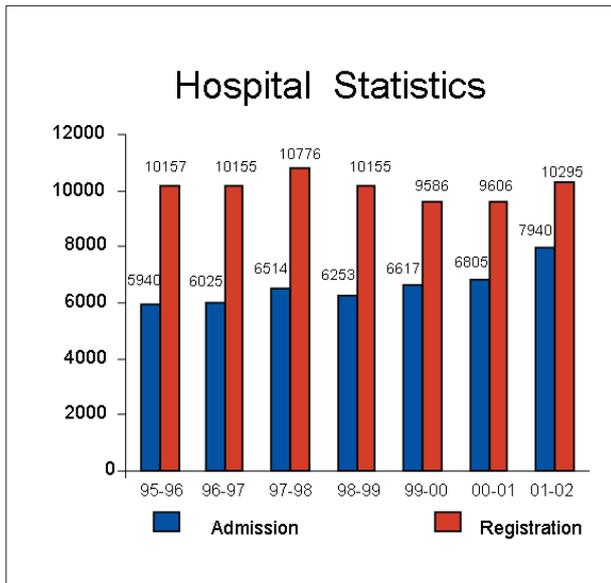
During the year 2001-2002, Hospital Services maintained the highest standards in all areas of patient care. There had been a keen contest among the clinical departments in adopting the latest developments and techniques from the World of Medicine. More number of patients from other states and neighbouring countries sought treatment from the Institute during the year.

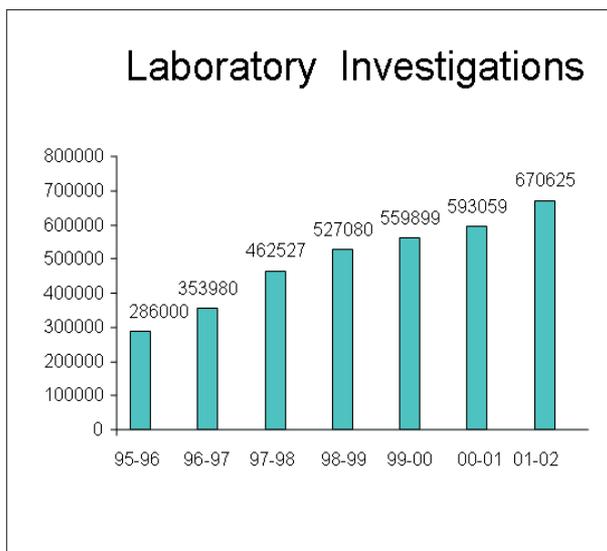
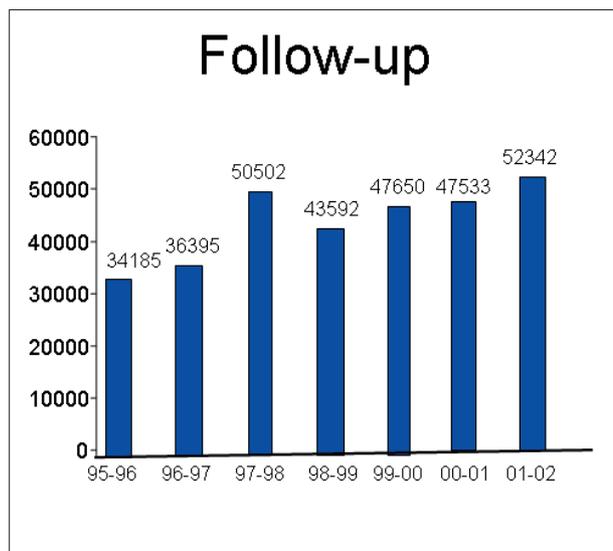
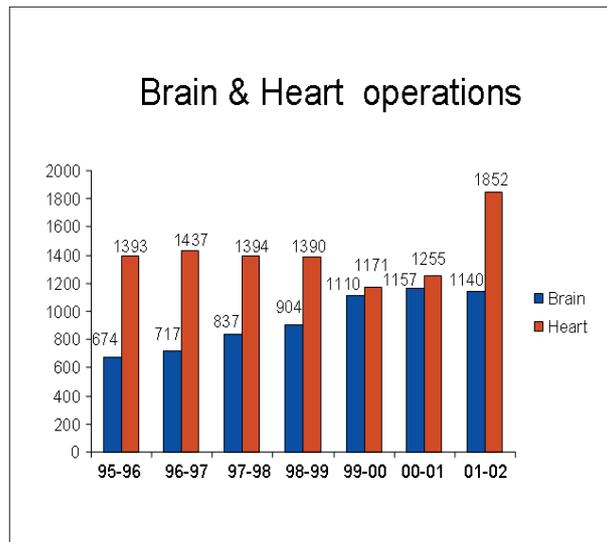
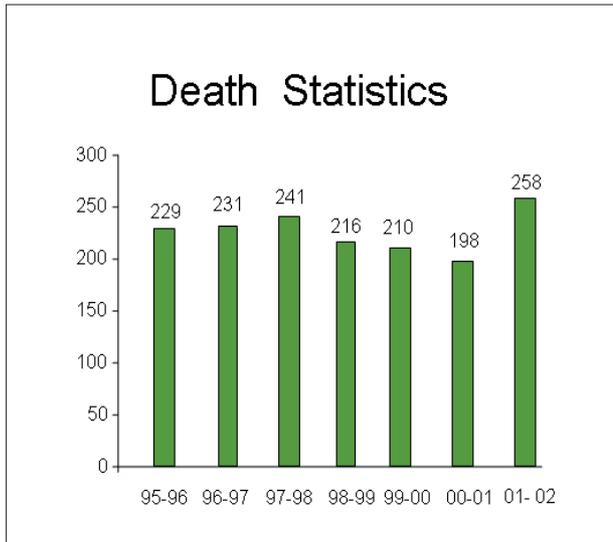
Thrust areas were Cardiac Surgery, Cardiac and Radiological intervention, specialized treatment for epilepsy and movement disorders. The Department of Cardiac Surgery through a conscious effort to reduce the long wait list increased the average daily operations from 5 to 7, with the existing facilities.

In order to comply with the Government of India regulations regarding disposal of biomedical waste, the Institute took a policy decision to join the IMA initiative (IMAGE) meant for this purpose. A modified system for billing the actuals in case of laboratory tests, medicines and disposables was also introduced during the year.

Medical Records

Medical Records Department remained the busiest department of the institution during the year 2001 – 2002. Twelve thousand new charts were added with the old collection of 3.2 lakhs. Hospital Management Committee members met four times and discussed about the management of patients, hospital statistics, infection data, court cases and prolonged stay of hospital inpatients. Their decisions were approved by the Director and implemented. The percentage of bed occupancy, bed utility rate, admissions, discharges, cardiac surgery and lab investigations increased by 10 % over the previous year. Adding 4 beds in medical coronary care unit enhanced the inpatient bed strength. Out of 3.2 lakhs records, 93,861 charts were retrieved for the purposes of treatments and scientific study. The separation work of active and inactive charts and pruning of bulk charts were continued. 4,000 waiting patients in cardiac surgery were asked to report to cardiac surgery out patient department for their admission date. Thus the waiting list was reduced.





NUMBER OF CHARTS RETRIEVED

Follow up in special clinic	52,342
Correspondence of patients	12,000
Analytical studies	9,240
Inactive	12,030
Pruning	8,005
Internal audit	100
Checking for other purposes	150
TOTAL	93,867

IMPORTANT STATISTICS

Number of beds	236
Percentage of bed occupancy	72
Cardiac Surgery	1,852
Perfusion	1,345
Neuro surgery	1,140
New registration	10,295
Repeat cases	52,342
Admissions	7,940
Discharges	7,949
Death	258
Average length stay	8
Bed turn over rate	34
Death rate percentage (Total deaths/total discharges)	3
Operation mortality percentage rate (Post operative deaths within 10 days of operation/number of operations)	3
Autopsy rate percentage	1
Lab investigations	6,70,625
Physiotherapy	32,955

Electocardiogram	18,000
Echocardiogram	22,960
Transesophageal echocardiogram	310
Pacemaker implantation	96
Treadmill test	1,976
Holter	389
Electro Physiology study	21
Pulmonary function test	421
Visual auditing and visual field charting	987

Department of Anesthesiology

Anesthesia support was given as shown below.

Patients	Number
Cardiovascular & thoracic surgery	2119
Neurosurgery	1098
Interventional & investigational Neurological & cardiac procedures	400

Division of Biochemistry

Activities of the division comprised of both routine clinical laboratory services and research related to clinical problems.

The Central Clinical Laboratory functioned round the clock providing investigative support in clinical chemistry, hematology and clinical pathology. The total number of procedures touched 4.93 lakhs which included not only routine tests, but also therapeutic monitoring of drugs and assay of enzymes like aryl sulfatase A and hexosaminidases A and B.

Division of Biomedical Engineering

As in previous years, the activities of the Biomedical Engineering Division included the installation of new equipments and maintenance of equipments and utilities, keeping maximum uptime.

Major new installations done in the current year includes a Deep Freezer (- 40 degree C) in Blood Bank, a digital camera – Professional –SLR- 35mm for the Medical Illustration, a video projector in Achutha Menon Centre and completion of installation and commissioning of multi parameters monitoring and recording system for use in various ICUs and operation theatres.

One of the most important activities for this year was the provision of infrastructure facilities for the smooth conduct of the yearlong Silver Jubilee celebrations of the Institute. In addition to the active participation in all the programs, the Biomedical Engineering Division undertook the responsibility of organising a two weeks MEDICAL TECHNOLOGY EXHIBITION, as the final event, along with the valedictory function. The theme of exhibition was “Technological Advancements in the field of Medical Diagnosis and Treatment” and the exhibits attracted many.

Division of Blood Transfusion Services

The focus of the division is on donor / patient service in the field of Transfusion Medicine. Every step was taken to adhere to good manufacturing practice. There was increase in the workload of the division concomitant with increase in hospital services. The outreach programme is on the rise. Issue of blood components to hospitals in Trivandrum district is on the increase; support was given to 40 hospitals during the year. Also, plasma was provided for preparation

of fibrin glue for clinical trials and scale up operations. National AIDS Control Organisation has identified the Division as a Blood component unit and has provided financial assistance.

Details of Procedures

Blood collection	6728*
Blood grouping	
Patients	18138#
Donors	8825
Compatibility testing	
Saline	12526*
Albumin	10020
AHg	2830
Antibody detection-AHg	12918#
Papain	23672*
Infection serology	
HIV	7892*
HCV	7810*
HbsAg	8184*
RPR	7141*
Components prepared	
RBCs	3589*
Platelets	466
Plasma (FFP & SDP)	3368*
Blood transfusion	
WBC & RBC	6331#
Platelets	364
Plasma (FFp & SDP)	2081#

* Increase by 30 to 80% over 2000-200.

Increase >100% over 2000-01.

New initiatives during the year are listed below.

1. Platelet function was studied in three different types of platelet storage bags of LL to assess platelet viability during storage.

2. A comparison was done of platelet yield by different methods (manual/automated) of blood collection to assess maximum yield.
3. A study on the incidence of TAH in surgical patients was initiated.
4. PCR based testing for Hepatitis B&C viruses is being done in collaboration with RGIBT to find out residual viral infection in donor blood units.

Laboratory performed 22,000 ECG, 1976 Treadmill stress tests, 23,000 Echocardiography, 310 Transesophageal echo studies and 380 Holter studies.

The Interventional cardiac lab performed investigations as given in the table.

INVASIVE INVESTIGATIONS AND PROCEDURES

Patients	Number
Coronary angiography	1,266
Cardiac catheterization studies.	362
PTCA and coronary stenting	176
Balloon mitral valvuloplasty	153
Balloon pulmonary valvuloplasty	21
Balloon aortic valvuloplasty	6
Balloon dilatation of coarctation of aorta	4
Other interventional procedures	6
Coil/Device closure of patent arterial ductus	41
Device closure of atrial septal defects	21
Pacemaker implantation	82
Electrophysiology studies	21
Radio frequency ablation for tachyarrhythmias	21
Balloon atrial septostomy	6

Social workers played an important role in patient counseling, assessment of income, motivation of blood donors, helping patients with epilepsy and movement disorders and also in establishing liaison with patients and the departments. Arranging financial assistance from social organizations helped poor patients.

Hospital Transfusion Committee regularly held its meetings. A major decision of the committee during the year was to extend blood bank services to other hospitals.

Routine blood grouping and blood donation camps were held, a minimum of three per month.

Awareness classes on blood donor motivation were conducted at several places in Trivandrum district, on a need basis.

Blood bank participated in the Med Tech Expo 2002, exhibition from 2nd to 10th March 2002. A Quiz competition and a Slogan contest Award for the promotion of voluntary blood donation were organized. Educative materials for the public were also prepared.

Department of Cardiology

During the year 2001-2002, 4676 new patients were registered in the department and 2843 patients were treated as in-patients. The Non-invasive Cardiac

The Department of Cardiology extended the facilities including primary angioplasty for acute care of patients with myocardial infarction. The number of patients seeking admission for treatment for acute myocardial infarction and primary angioplasty has shown a rising trend. Coronary interventions also increased during the year. The department has also standardized the biptome guided PDA coil occlusions.

Department of Cardiovascular and Thoracic Surgery

During the year 2001-2002 the Department achieved tremendous improvement in the quality and quantity of the clinical work. The number of open-heart operations showed an increase of 75%. There was an unacceptably long waiting period for patients requiring open-heart operations, in some cases extending upto ten years or more. By increasing the number of operations we were able to bring down the waiting period to one to one and a half years. This has especially helped hundreds of poor patients who cannot afford the treatment of any other hospital.

Computer Division

Major activities involved the software and hardware maintenance for all the user departments, development of new application softwares and system planning for future.

A 64K leased line between Hospital and BMT Wings was commissioned along with the 64K internet-leased line. Tenders for gigaspeed cabling, 'C' compiler for SUN server & contract for web site maintenance were finalised.

Hardwares added were: IBM Server Pentium III 1.5 GHz; 1GB RAM, 2x20 GB HD - 2 numbers were installed as server for the classroom in AMC and as a server for ward/icu Nodes. PC Pentium IV, 128 MB SD RAM, 20 GB HD - 2 nos; Thin clients (Diskless network nodes) - 20 numbers; Printer 24 pin dot matrix - 5 numbers; Terminal Server - 2 numbers.

All old VT 100 terminals were connected to the LAN using Terminal Server, removing the old line drivers.

The division purchased Microsoft Server 2000, with client access licence, SPSS statistical package for server

2000, Mdaemon mail package, Norton Corporate Edition for servers.

Inhouse software developments included the softwares made for new IP Billing software, Pension, PF, Video EEG/EMG/EEG reporting, discharge summary for epilepsy ward, substore program, accounting software for BMT Wing, old department stock entry, pathology reporting, DSA reporting and the development of a new web page.

Efforts were also made to familiarize the newly joined students and nursing staff on the optimal utilisation of the machine and softwares. Computer awareness classes on Windows 95 & MS Office were conducted at the campus for them.

Division of Microbiology

Bacteriology, Virology and Immunology sections of the division offered diagnostic services and an increasing trend in the number of investigations was noticed. A new initiative was Leptospira culture work.

Microbiology division stepped into automation by acquiring an Immunoanalyser to cope up with the new addition of serological tests. More sensitive tests were introduced for screening samples from patients for HIV and Hepatitis B, by switching over to 4th generation ELISA's and ELFA technology (Enzyme linked immuno fluorescent assay).

Department of Neurology

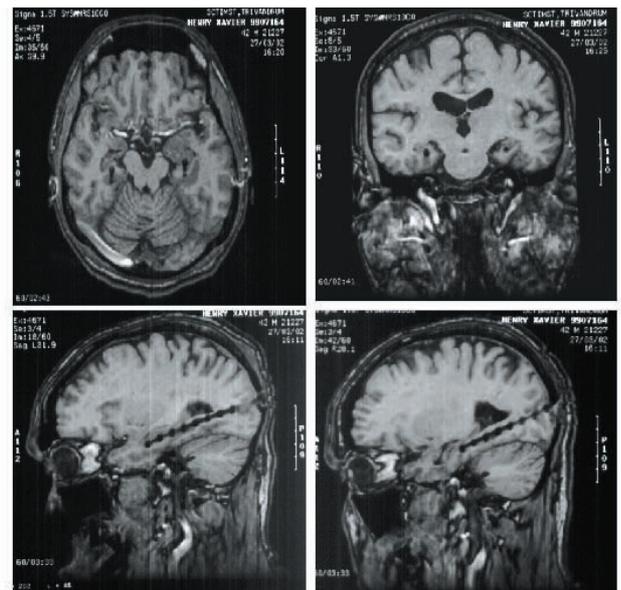
The department, in addition to the general outpatient and inpatient services, initiated several new activities and research projects. The ongoing programmes in subspecialties and the department in general, is outlined below.

Epilepsy Section

The R.Madhavan Nayar Center for Comprehensive Epilepsy Care, the first of its kind in the country, entered its 4th year. This center has a strong social base; thanks to the comprehensive community survey conducted in the state and the regularly conducted outreach epilepsy clinics. This ensures that the newer technologies regularly acquired by the center is viewed in its proper perspective and utilized in a cost effective manner.

1. Epilepsy Care

The twice-weekly epilepsy clinics at the institute and twice monthly community outreach epilepsy clinics were regularly conducted. Intra operative



MRI guided stereotactic implantation for mesial temporal depth electrodes for long term seizure monitoring

electrocorticography was started on a routine basis for epilepsy surgery from October 2001. We also started doing Cortical Stimulation and Mapping of eloquent brain areas like motor and speech areas during neurosurgery. With the implantation of subdural grids and strip electrodes in a patient from Jammu & Kashmir in January 2002, the center became the first one in the country to start invasive long term epilepsy monitoring. MRI-guided stereotactic implantation of mesial temporal depth electrodes for long term seizure monitoring was also started. Seventy-six patients underwent surgery for medically refractory epilepsy.

PATIENTS SEEN AND PROCEDURES

Patients	Number
Epilepsy clinic attendance	4475
Outreach epilepsy clinic attendance	1320
EEG	2466
Video-EEG	278
Electrocorticography	34
Depth electrode recording	6
Cortical stimulation and mapping	10
Wada test	30
Number of epilepsy surgeries	76

2. Epilepsy Education

Regular group sessions are conducted for one hour before each epilepsy clinic, to provide information on epilepsy to patients and families. This is conducted by a medical social worker and a psychologist. Similar sessions were carried out for the public and general medical practitioners through the outreach programme. On the National Epilepsy day, 17th November 2001, a painting competition was

conducted for children with epilepsy. The quarterly publication of the epilepsy self-help group ‘Pratheeksha’ also served as an important medium of epilepsy education.

Neuromuscular Section

PATIENT CARE

Patients	Number
Number of Clinic attendance	787
Number of ENMG studies	620
Evoked Potentials	102
Number of sessions of large volume plasma exchange	120
Number of nerve/muscle biopsy	65
Number of Thymectomy surgeries performed	23

Movement disorder section

Movement disorder clinic attendance was 964. Individual as well as group counseling and education sessions were conducted for an hour prior to every clinic by trained medical social worker. The physiotherapist attached to the clinic provided supervised physiotherapy and consultation services. Thirty patients were evaluated and selected for deep brain stimulation (14) and lesioning surgeries (16). Post-operative evaluations were done for 94 patients. DBS programming was performed for 22 patients. A new international drug trial for Parkinson’s disease was completed.

Botox clinic: 35 patients received Botulinum toxin therapy in the clinic. EMG guided botox injections were started. The indications were expanded to include cerebral palsy and spasticity.

Stroke Section

Number of clinic attendance :	1299
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A 45 minutes session is conducted before the stroke clinic educating the patients on various rehabilitative and preventive aspects of stroke, moderated by an occupational therapist.

Cognitive and Neurobehavioral Section

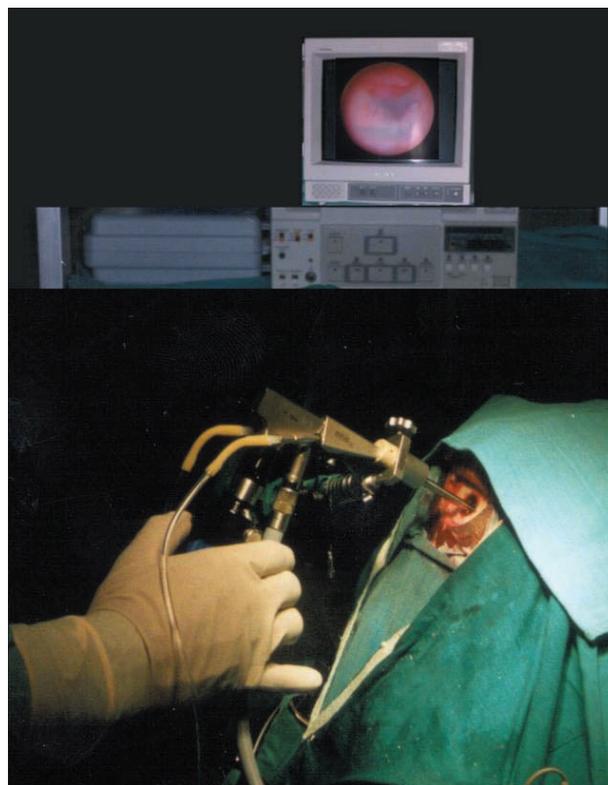
Streamlining the Cognition section (Cognitive and Behaviour neurology) has been done and the activities of the Memory and Neurobehavioral Clinic (MNC) has changed to focus on adult acquired cognitive problems.

ROUTINE ACTIVITY CENSUS

Patients	Number
Number of Memory and Neuro-behavioral clinics conducted	49
Number of patients seen in MNC	176
Number of new patients diagnosed with dementia	34
Number of neuropsychological evaluations done	435
Number of speech therapy sessions conducted	797
Number of speech evaluations done	294
Relaxation therapy	42
Counseling	280
IQ assessment	45

Department of Neurosurgery

Celebrating the 25th year of existence, the department progressed, furthering its excellence in all areas of Neurosurgery. There was a steady increase in the number of cases operated, though the types of cases were becoming distinctly complex, as more and more Neurosurgical centers started doing less complex cases elsewhere in the state and the country. The major areas of focus were – Neuro-vascular, CP angle, Skull base, Endoscopy, Spinal Instrumentation, Epilepsy and Movement disorder surgery. A total of 1141 cases were operated with an overall mortality figure of only 2.9%. The faculty and the students maintained the high standards of the institute in the conferences and meetings attended. To celebrate the completion of 25



Key-hole operation for intracranial lesion

years of Neurosurgery, a meeting, “SILVERNAM”, was organized on the 12th and 13th of May 2001, where all the alumni members, students and the faculty of the department gathered and exchanged their experiences. The department co-sponsored the Annual CME and meeting of the NSI Kerala chapter during February 2002.

This year there has been an increase in the total number of majorsurgical procedures, and a decrease in minor surgical cases.

NUMBER OF PATIENTS OPERATED

Patients	Number
Vascular	165
Cerebello pontine angle	48
Sellar/Suprasellar	65
Skull base	53
Epilepsy	71
Movement disorder	23
Sterotactic procedures	52
Endoscopy	46
Posterior fossa tumours	65
Spine	158
CVJ	33
Supratentorial tumours	198
Others	168
Total	1141

Division of Pathology

The division offered diagnostic services to patients with neurological and cardiac diseases. During the year over 1400 surgical specimens and 380 frozen-section (intra-operative) diagnosis were performed. The division actively conducted fortnightly case discussions and clinico-pathological conferences for the post-graduates in Neurology and Neurosurgery.

The division also helped the post graduate students in Neurology and Neurosurgery in their research work and preparation of dissertation. The division also performed all immunopathological immunohistochemical procedures, muscle enzyme histochemical studies for muscular and have muscular diseases.

Physiotherapy Section

The rehabilitation work of the section was aimed at achieving early independence for in-patients with active and passive physiotherapy. In addition out-patients were also given physiotherapy using the specialized equipments available in the unit.

PATIENTS TREATED BY PHYSIOTHERAPY

Patients	Number
Cardiac surgery	16112
Thoracic surgery	8368
Neurosurgery	6417
Neurology	8860
Out patients	2342

The unit also contributed to the teaching and training of observation trainee physiotherapists and post basic Nursing course students in physiotherapy and rehabilitation.

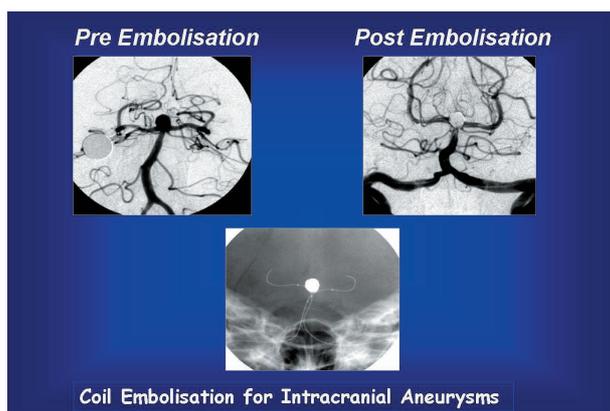
Public Relations Section

The section was responsible for bringing out the health education brochures and for the official language implementation activities of the Institute.

The Hindi fortnight celebrations were inaugurated by Justice Sri. Sukh Dev Singh Kang, the Governor of Kerala. One hundred and twenty participants from various Central Government Institutions participated in the workshop.

The section coordinated the visit of teams of journalists from various parts of India through the Public Information Bureau.

Department of Radiology



DIAGNOSTIC PROCEDURES

No.	Procedures	No. of Cases
1	Plain X-rays	23,724
2	MRI Scans	2,308
3	CT Scans	4,341
4	Ultrasound Scans	2,464

INVASIVE DIAGNOSTIC PROCEDURES

No.	Procedures	No. of Cases
1.	Peripheral angio	286
2.	4 Vessel angio	557

Interventional Radiology

A total of 295 patients were treated by interventional radiology procedures. Among them 208 patients were admitted under interventional radiology.

INTERVENTIONAL PROCEDURES

Interventional Procedures	Total (No. of cases/ Procedures done)
Cerebral arteriovenous malformations (AVM)	37/68
Dural arteriovenous fistula (AVF)	4/10
Aneurysm coiling	8/12
Vein of Galen malformation	2/10
Carotid stenting	5/6
Intracranial angioplasty stenting	2/3
Occlusion test (Carotid)	3/3
Thrombolysis	10/14
Intracranial vasospasm	2/3
Spinal AVM/AVF	2/5
Angioplasty: Renal	1/3
Superior mesenteric artery	1/1
Aorta	2/2
Peripheral: Iliac	18/24
Femoral – popliteal	14/19
Peripheral stent graft	4/7
Bronchial artery embolisation	18/32
Inferior venacaval interventions	3/3
Embolisation:	
Vascular malformation	8/12
Head & neck	11/20
Peripheral	2/8
Renal	
Oesophageal dilatation/stenting	2/3
Hepatic chemoembolization	1/2
Hepatic hemangioma	1/1
Percutaneous CT guided biopsy	51/55
Laser ablation of osteoid osteoma	2/2
Uterine artery embolisation	17/25
Catheter retrieval	2
Fibrinogen injection to sinus tract	1/1
Carotico jugular fistula	1/2
Vertebroplasty	11/13
Pulmonary arteriovenous fistula	2/4
Gastrointestinal bleed embolization	1/3
Gastric stenting	2/2

List of Equipments Costing Rs. 50,000/- & above purchased during the year

Heater Cooler unit
 Transonic Flowmeter
 Liposofast Basic and Stabilizer
 Microplate Reader
 Slide Projector
 Patient monitoring system
 CO2 Incubator
 Water bath with shaker
 Thermometer Thermistor
 Waveform Generator
 Micro hardness Tester
 Temperature and pressure calibrator
 ICE Flaking Machine
 Thermal Cyclor
 Electrical Sternal Saw
 Analog circulator and accessories
 Centrifuge Machine
 Trinocular Research Microscope
 Autoclave
 HPLC Column
 Multimedia projector
 Infusion Pump (10 Nos)
 Planetary Mill with accessories
 Hanaluk OT Light
 Electrical Sternal cutter with accessories
 Holer Recorder
 ICU Ventilator
 Refrigerated Centrifuge
 Refrigerated Centrifuge
 Photocopier
 Neuro Drill System
 Defibrillators & Biophasic Monitors
 Patient Monitoring System
 Refrigerated Centrifuge
 Heart Lung Machine & Sternal Cutter with accessories
 Heater cooler unit for Heart Lung Machine (2 Nos)
 Spectroflurometer
 Automatic Staining Machine
 Leased line modem (3 Nos)
 Pulse Oximeters (2 nos)
 Lap Top Computer
 Lap Top Computer
 High Speed Steam Sterilizer
 Water Purification system
 H.P Monitor with ECG Module
 Electrolyte Analyser
 Skull Clamp
 Neuro Drill System

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 21 scholars. The Institute has, as of now, 19 scholars for the Ph.D programme, 19 students enrolled for the Post Basic Nursing Certificate programme and 25 students for the various diploma programmes.

A fellowship programme of one-year duration for post DM/MCh candidates was initiated. Three candidates were admitted during the year. They were Dr.R.Pradeepkumar, Dr.Rakesh K.Goyal and Dr.Ahsan Moosa. They worked on projects “Total Artificial Heart”, “Aneurysms” and “Neurocritical Care” respectively.

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

DM (Cardiology)

Krishnakumar, MD
Anand Srinivasan. K, MD
Sonny P Jacob, MD
Krishnakumar Nair, MD
Rajeev.E, MD
Siva Subramaniam. P, MD
Balu Vaidyanathan, MD
Hemant Madan, MD
Nirmal Kumar.P, MD
Byiju C.K, MD
Stijimon Joseph, MD
M.S. Harikrishnan, MD
Sreeram. G, MD

DM (Neurology)

Ashalatha. R, MD
Sanjeev.V.K, MD

Vinayan.K.P, MD
 Sreekumar. J, MD
 Rajesh.B, MD
 Parameswaran.K, MD
 Somarajan. A, MD
 Tomin Mooney, MD
 Firosh Khan.S, MD
 Rakesh. H. Shah, MD
 Ruchir Divatia, MD

DM (Neuro Radiology)

Dandu Ravi Varma, MD
 Sukalyan Purkayastha, MD
 Hemant Sonwalkar , MD

MCh (Cardiovascular and Thoracic surgery)

Girish Warriar, MS
 Amit Mishra, MS
 Anbarasu.M, MS
 Paresh.P Shah, MS
 Baiju.S.Dharan, MS
 Anand.K.T, MS
 Milan Kundu, MS
 Murugu Sundara Pandiyan. R, MS
 Manoranjan Misra, MS
 Gopakumar.V, MS
 Sai Kiran K V S S, MS
 Murali Krishna, MS
 Akbari Jayesh Kumar, MS
 Sathyaki N.P , MS

MCh (Neurosurgery)

Easwer.H.V, MS
 Mathew Abraham, MS
 Sanjeev Kumar, MS
 Muthu Retnam, MS
 Sudish Karunakaran, MBBS

Rajeshkumar.J, MS
 Somesh Desai, MS
 Krishnakumar. K, MS
 Sunil Valentine, MS
 Jimmy Mathew, MS
 Mukund Prasad, MS

PDCC (Anaesthesiology)

Mohan David. M, MD
 Srikanth M.L, MD
 Sameer P. Mande, MD
 Vishwas Malik, MD
 Nikhil Desai, MD
 Dinesh.A, MD

PDCC (Radiology)

Rajendran. V, MD

PDCC (Vascular Surgery)

Madhavi Latha, MS

Ph.D Candidates

Sangeetha.S.R
 Indira Adiga S
 Manju.L
 Sumi Mary George
 Suneesh Kumar
 Abiraman
 Vijai. J
 Shiney Velayudhan
 Santhosh Kumar. T.R
 Anilkumar, PR
 Krishnaprasad.C
 Leena Kuruvilla
 Biji Balakrishnan
 Elizabeth George
 Asha.S. Mathew
 Bernadette K. Madathil

Bijoy Chellan
Sapna. S
Sailaja. G.S

Master of Public Health

Rohina Joshi
Sandeep .K
Ajay. VS
Pradeepkumar. K.P
Jeemon.P
Rani. K.R
Manju Nair,R
Paul Kumaran. P
Thankachy Yamini Ramachandran
Chitra Grace. A
Sonia Andrews
Sailesh Mohan
Laxmaiah. A
Bimal Kumar Rai
Karma Jigme Topgay
Tseten Yamphel Bhutia
Thinlay Wangya
Asha Raghavan
Vinai Krishna Sinha
T.Kanchana
Devashish Bhattacharyya

Candidates awarded Ph.D Degree

Scholar's Name	Thesis title	Guide
1. Preeti.R.	Stimulation of Cardiac Fibroblast Proliferation by Lanthanides:A Superoxide Anion Mediated Response.	Dr. R. Renuka Nair
2. Sheela George.	Polymer Matrices for Cell Encapsulation.	Dr. Prabha D . Nair

Scholar's Name	Thesis title	Guide
3. Kumaran.C.	Mitogenic Effect of Substance P on Cardiac Fibroblasts: A Neural Pathway of Activation of Cardiac Connective Tissue Growth.	Dr. K.Shiva kumar
4. Balu.K. Chacko.	Interactions of Carbohydrate Binding Human Immunoglobulins with Glycoconjugates Bearing Corresponding Epitopes.	Dr. PS. Appu kuttan
5. Resmi. K.R.	Detection of Molecular Heterogeneity on Platelet alpha- Granule Proteins and its Assay Using Monoclonal Antibodies Developed against beta-Thromboglobulin.	Dr. Lissy K. Krishnan
6. Vinoy Thomas	Biomaterials Science - Studies on Biodurable Polymers for Application in Cardiovascular Devices.	Dr M. Jayabalan

List of successful candidates for DM / MCh

Name of candidates	Degree	Speciality
B R J Kannan	DM	Cardiology
Rakesh. P . Gopal	DM	Cardiology
Santosh Kumar Dora	DM	Cardiology

Name of candidates	Degree	Speciality
Rajesh. R	DM	Neurology
Mahalekshmi. P	DM	Neurology
Boby Varkey.M	DM	Neurology
Anu Jacob	DM	Neurology
Sameer. S. Diwale	MCh	CVTS
Anudath.K.B	MCh	Neurosurgery
Rajesh. B.J	MCh	Neurosurgery
Krishnamoorthy	DM	Neuroradiology

List of successful candidates – Post Doctoral Certificate Programme

Hari. R	Anaesthesiology
Shikha Gupta	Anaesthesiology
Manoj Subramanian	Anaesthesiology
Baiju Sekhar	Anaesthesiology
Nilesh Manohar Juvekar	Anaesthesiology
Abdul Vahab.T.T	Anaesthesiology
Sheik Akbar Hussain	Radiology
Sreekumar. R.C	Vascular Surgery

List of successful candidates for Master of Public Health (MPH)

Praveen Kumar. N
K. Hemachandran
Joy Varghese
Saiju Hameed
Betty Susan Ninan
Deepa Mathew
Roy. N
Biju Gopinath
Md. Shafiul Islam

List of successful candidates for Post Basic Certificate Programme

Name of Candidates	Speciality
Kottoor Priya Jose	Cardiac Nursing
Betty Thomas	Cardiac Nursing
Jeby Abraham	Cardiac Nursing
Abitha Susan Abraham	Cardiac Nursing
Smitha Paul	Cardiac Nursing
Jaiby Augustine	Cardiac Nursing
Esther P Hormise	Cardiac Nursing
Shilaja Mathews	Cardiac Nursing
Reeba Babu	Cardiac Nursing
Jisha James	Neuro nursing
Beena A Pillai	Neuro nursing
Latha. R	Neuro nursing
Shijimol Sebastian	Neuro nursing
Biju.S	Neuro nursing
Elizabeth John	Neuro nursing
Ahila.D.L	Neuro nursing
Marian Koshy	Neuro nursing
Nirmala. N	Neuro nursing

List of successful candidates for – Diploma and Certificate Programmes

Name of Candidates	Speciality
Shinto Joseph	Cardiac Lab Technology
Krishnakumar.VL	Cardiac Lab Technology
Maneesha. A.B	Cardiac Lab Technology
Salini K.R	Neuro Technology
Ajithkumar.K	Neuro Technology
Binu Thomas	Operation Theatre Technology
Shibu. V.	Operation Theatre Technology
Jasmin Yoosuf	Clinical Perfusion Technology
Christudas. J	Medical Records Science

Name of Candidates	Speciality	Institutions	Progr- amme	Dura tion	No.of students
Prameela PK Johnson.C	Medical Records Science Advanced Medical Imaging Technology	College of Nursing, Thiruvananthapuram	M.Sc(N)	4 weeks	4
Sheeba Kumar. R	Advanced Medical Imaging Technolgy	College of Nursing, Kozhikode	M.Sc(N)	1 week	4
Rajesh Kumar. R	Advanced Medical Imaging Technolgy	Fr. Muller's College of Nursing	M.Sc(N)	4 weeks	6
Lincy James Vimal Sathyan	Blood Banking Technology Blood Bankign Technology	College of Nursing, Kozhikode	B.Sc(N)	2 weeks	38
		College of Nursing, Kottayam	B.Sc(N)	2 weeks	44
		PSG College of Nursing, Coimbatore	B.Sc(N)	1 week	6
		Karolinska Institute, Sweden	GNM	1 day	25

Nursing Education

The fourteenth batch of Cardiovascular and Thoracic nursing and the tenth batch of Neuro nursing students successfully completed their programme in December 2001. There were 18 graduates this year adding up the total number to 194 over the past 14 years, Currently 18 students are undergoing training in these two programmes.

Nursing students from institutions all over the country were provided clinical experience for periods varying from two weeks to one month. Nineteen postgraduates students from 4 institutions and 88 graduate students from three Institutions utilized the clinical field of this institute for their study purpose. Nursing students from Karolinska Institute, Sweden also visited the institute on two occasions during the current year. The details are given below.

Institutions	Progr- amme	Dura tion	No.of students
R.A.K. College of Nursing, New Delhi	MN	4 weeks	1
College of Nursing, Thiruvananthapuram	M.Sc(N)	2 weeks	4

Quiz programme for nursing staff and students continued on a monthly basis with the help of computer network. DGHS aided workshops and short-term training programme for nurses were held at the Institute, College of Nursing, Kottayam and College of Nursing, Trivandrum. The Instructor in Nursing delivered lectures and conducted group discussions in these workshops.

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 purposes by using latest information technologies like CD-ROM Network, Intranet and Internet. Library registered nearly 50 journals for their free on-line

access. User ID and Passwords were circulated among the users to browse or download full text articles from the concerned websites of those journals.

Circulation using Barcode system was fully implemented and the card system was withdrawn. This facilitated quicker and error free circulation of the documents. All the members were given their membership card with Bar-coded ID number.

During the year, in the Hospital wing library the number of books rose to 11420 and bound volumes to 12928. The number of current journals subscribed in this library is 120; 15 journals are Indian. Collections in BMT wing library are as follows; Book

collection - 8900, Bound volumes - 5002, Standards & Patents – 2084. The number of current journals subscribed by the library is 79.

The book collection of the Health Science Studies library was merged to the Hospital library collection.

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

On a trial basis, photocopying work of the library documents (Books and Journals) was given to a private agency to get a faster service to the users.

TRAINING PROGRAMS

Observer trainees deputed from other Government institutions were also entertained. Guiding project work, delivering technical talks etc. for outside students were also done as in previous years.

Department of Anesthesiology provided short-term training candidates from Jamsedhapur (Tata Main Hospital), Nagpur, Orissa and Kerala.

Forty staff members of Terumo-Penpol Ltd underwent training in blood collection and blood component preparation in Blood Bank. One Blood Bank Medical Officer and 3 technicians from Kottayam Medical College underwent one-week training on blood components.

Residents from the Neurosurgical departments of AIIMS, New Delhi; NIMHANS, Bangalore; CMC, Vellore; KMC, Manipal; all the Medical Colleges in the state of Kerala; Madurai Medical College, etc were given clinical attachment under the department, as a part of their training programme.

Ms. S Aruna, Lecturer, Vaniyamdadi Women's college, and Dr. D P Anand, from Mysore Medical College, spent two months in the Division of Cellular & Molecular Cardiology, sponsored by fellowships from Indian Academy of Sciences under their summer research fellowship programs for university teachers and students. Ms Smitha carried out her M Sc dissertation work for three months in the division under the guidance of Dr.Renuka Nair.

Dr.Muralidhar K.Katti guided an MSc student Mohammed Azeem S from CMR Institute, Bangalore University.

Four demonstrators and 5 trainees from Sundaram Medical Foundation, Chennai and 21 students from School of Medical Education, MG University, Kottayam were observers in Medical records Department. Four of them did project work under the guidance of Krishnamoorthia Pillai.

Candidates with social science background were given training as apprentices in Medical social work. Observer trainees were admitted to the Physiotherapy and Dietary departments. Hospital Management trainees from MG University were given orientation and guidance in fulfilling their project reports.

The following students underwent training at BMT wing.

Dr. Arun Sadasivan, MDS student, Department of Periodontology, Dental College, Trivandrum for the thesis entitled “Comparative Evaluation of Chitra HABG Composite Ceramic Granule and Ossopan-Chitosan sol in the management of Periodontal Infrabony Defects - A Clinical Study”.

Miss. Sailaja G.S., M.Tech Student of Department of Polymer Science and Rubber Technology, Cochin University of Science and Technology, Cochin for the project work entitled “Hydroxyapatite filled Chitosan - Poly acrylic acid polyelectrolyte complexes for bone substitute applications”.

Mr. Sreehari C.V and Mr. Manoj G, M.Sc. students of Department of Physics, Kerala University for the project work entitled “A Study on Optimization on Slip Casting Parameters of Hydroxyapatite Bioceramic Powders Prepared by Precipitation Methods”.

Ms. Kavitha, A.P., M.Sc (Applied Chemistry), University of Calicut, for the project work “Hydroxyapatite as a potential filler in dental composites”.

Ms. Anju.T. Mathew, M.Sc (Chemistry), Department of Chemistry, Catholicate College, Pathanamthitta, MG University, for the project work “Aging and shelf life studies of a light cure dental composite incorporated with a new radioopaque glass filler”.

Ms. Sandhya Sundaram, B. Tech student from Sardar Vallabhbhai Regional College of Engineering.

Ms. Julie John, Dept. of Polymer Engineering, M. G. University, Kottayam, worked and submitted a dissertation entitled ‘Synthesis and characterization of semi-IPNs based on PVC and transition metal

methacrylates’ for the partial fulfilment of her B. Tech degree.

Ms. Priya, T. K., Dept. of Chemistry, University of Calicut, worked and submitted a dissertation entitled ‘Studies on modified hydroxy apatite’ for the partial fulfilment of her M. Sc degree.

Mr. Venkitesh Reddy PV for Degree: MSc (Gurudasipur University, Bilaspur)- Title of the dissertation: Analysis of RNA editing in glutamate receptors by RT-PCR.

Mr. Mahesh M for Degree: MSc (Gurudasipur University, Bilaspur)- Title of dissertation: RNA editing in glutamate receptors: developing a modified RT-PCR method.

Ms. Swapna. PS, student of B.Tech (Polymer Science & Rubber Technology) from Dept. of Polymer Science & Rubber Technology, Cochin University of Science and Technology, Kochi worked on the project “Studies on glycidylmethacrylate grafted natural rubber latex.”

Miss. Blessy Philip, Dept. of Chemistry, Catholicate College, Pathanamthitta, Kerala completed her M.Sc. Project.

Training imparted to BMT wing staff

In connection with the on-going accreditation programme at BMT Wing the following training programmes were conducted.

A two day training programme cum workshop on general metrology calibration systems and measurement uncertainty and awareness of ISO 17025 was conducted by Systems and Training, Mumbai at the BMT Wing, SCTIMST, Thiruvananthapuram on 17 & 18 May 2001.

A one-day awareness and appreciation programme on ISO/IEC 17025 standard was also conducted by Systems and Training, Mumbai at the BMT Wing, SCTIMST, Thiruvananthapuram on 12 July 2001.

A two-day course on Internal Auditing of Laboratory Quality System as per ISO/IEC 17025-1999 standard

was conducted by Systems and Training, Mumbai at Thiruvananthapuram on 13 & 14 July 2001.

A five day Laboratory Assessors Course was conducted by National Accreditation Board for Testing & Calibration Laboratories, New Delhi, from Jan 28 to 01 Feb 2002 at Hotel Pankaj, Thiruvananthapuram for training and qualifying as an NABL Assessor.

Functions, Workshops & Conferences

Silver Jubilee Functions

We had our first function, a public contact program and an open forum on preventive cardiology, inaugurated by His Highness Sri. Uthradom Thirunal Marthanda Varma. This was followed by a well-attended alumni meet in which our founder Director Dr. MS.Valiathan moved us with an ardent, thought provoking and inspiring address. We had several academic programs, which included a seminar for medical students, a continuing medical education program for general practitioners, a one day program on animal experimentation for biomedical devices development, a national seminar on Ethics in Animal Experimentation, a national workshop for the nurses and five orations in different disciplines. The cultural evening organized by our employees, the students' day and nurse's festival helped us to spot many hidden artists amongst our colleagues and the silver feast provided an opportunity to get to know the family of our associates. All these festivities were capped by the enthusiastic public response to the medical camp, the seminars, the multimedia presentations on our activities and the medical technology exhibition held to precede the validictory function. Dr.R.Chidambaram, Principal Scientific Adviser to the Government of India was the Chief Guest for the final function. Three publications, Silver Lines, a record of our history and achievements, a health education monograph and a souvenir, which would include a photographic account of the silver jubilee activities, are on the anvil.

The organizing committee for silver jubilee functions had excellent support from the friends of Chitra; individuals, our institutional partners, pharmaceutical companies and industrial collaborators, government agencies, journalists, radiomen and tele-men.



His highness Sri. Uthradom Tirunal Marthanda Varma inaugurates the open forum in connection with Silver Jubilee celebrations



Speaker of Kerala legislative assembly Sri. Vakkom B. Purushothaman inaugurates the cultural evening



Director Dr. K. Mohandas presenting silver jubilee memento to the founder director Professor M.S. Valiathan during alumni meet



Mr. Balabhaskar and troupe singing at the family fest



Minister for Transport Sri. B. Ganeshkumar inaugurates the family get together in connection with silver jubilee celebrations



Sri. V. Ramachandran, Vice-Chairman, State Planning Board inaugurates Medical Technology Exhibition



Speaker of Kerala Assembly, Sri Vakkom Purushothaman delivering his address at the cultural evening



(1)



(2)



(3)

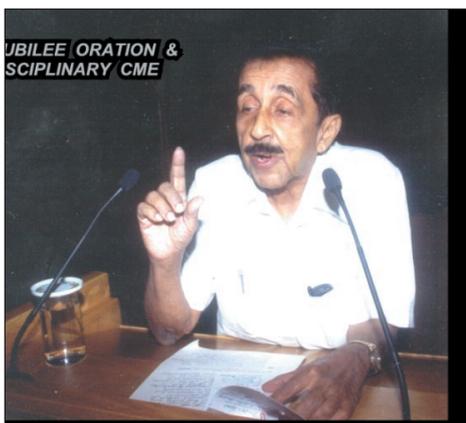
(1) Princess Aswathi Thirunal inaugurates the Nurses' day.

(2) Principal Scientific Adviser to the Government of India, Dr. R. Chidambaram delivers his address during the valedictory function of silver jubilee celebrations.

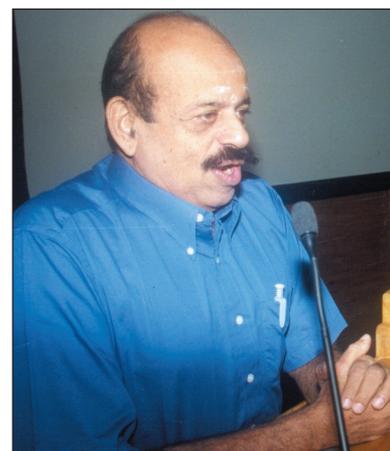
(3) Dr. NH. Wadia, President of the Institute hands over the silver jubilee memento to Sri. Hashta Bahadur, one of the first employees.

(4) Professor RM. Varma, former director of NIMHANS delivers the inaugural address during the CME program for general practitioners.

(5) Prof. M. Sambasivan delivers Silver Jubilee oration during the academic seminar for medical students.



(4)



(5)

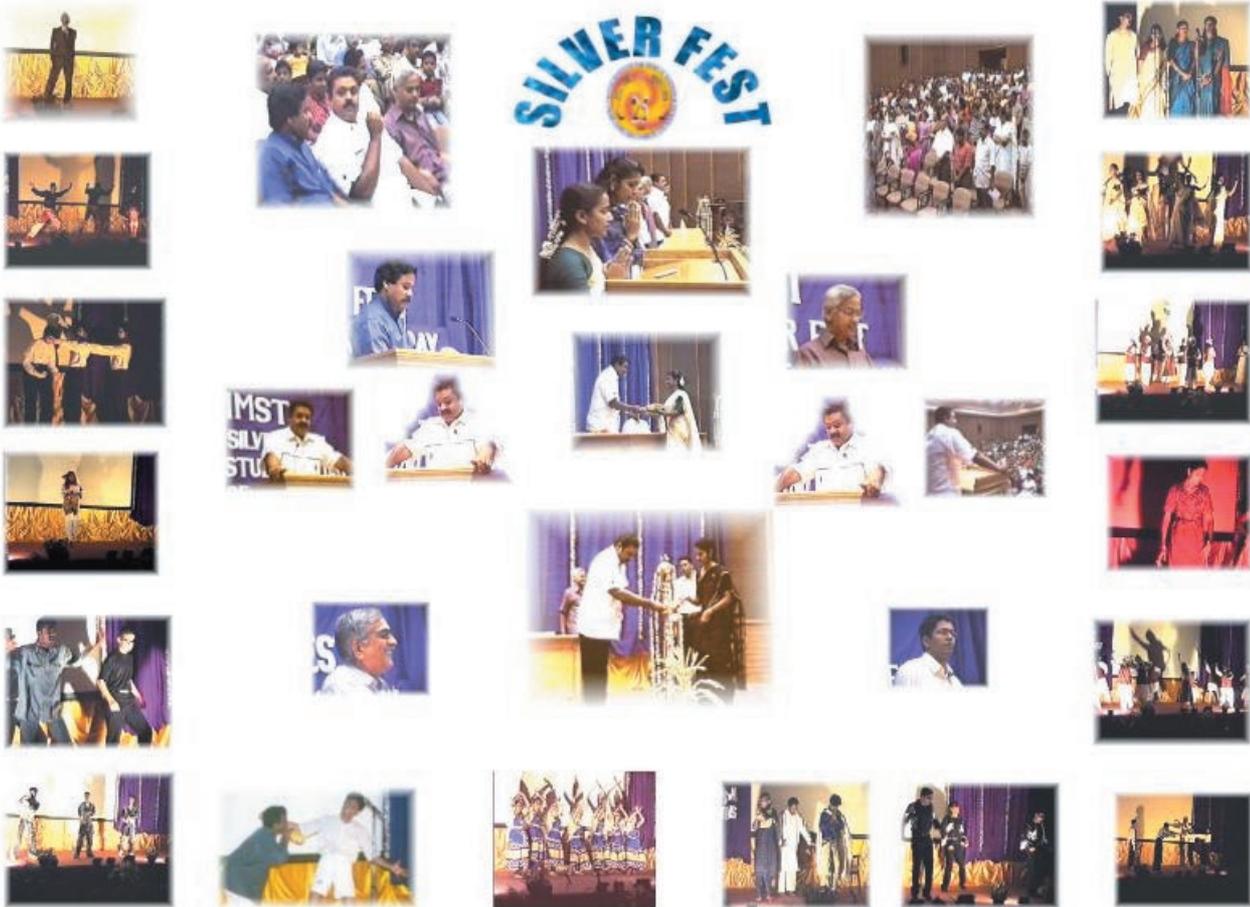


Cinematic dance by the children of employees during the valedictory function



'Jubilee, Jubilee, Rajatha Jubilee'- thematic song being sung by the employees

STUDENTS DAY 2001





Dr. Kailash Bhatia delivers silver Jubilee oration

The AMC Seminar Series was inaugurated by Prof.K.Mohandas, Director of the Institute and Dr.K.R.Thankappan presented a paper on the topic “Current status of Service Delivery in the Health and Family Welfare Sector in Kerala”.

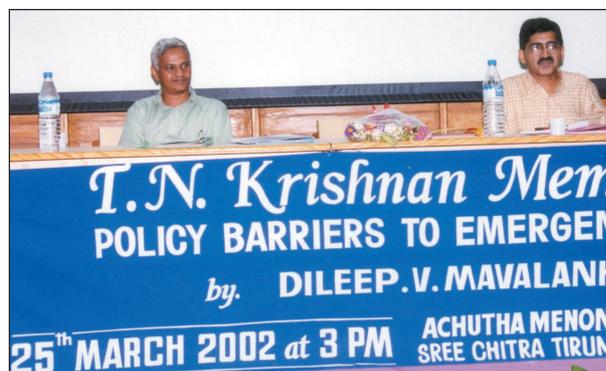
A training programme was arranged at the Achutha Menon Center for the District and State Level Health Officers from Gujarat. Twentyone Health Officers



Dr. Balaraman Nair inaugurates the workshop on Animal Experimentation in Biomedical Devices Development



Dr. Richard Cash and Dr. Amar Jesani at the seminar on Ethical Issues



Dr. Dileep V Mavalankar delivers TN Krishnan memorial lecture

attended the training programme. The purpose of the programme was to analyse the reasons behind the rapid progress in health in Kerala and to impart the same to the rest of the country for such health improvement.

Blood Bank organized a workshop and awareness classes for the teenage group, women groups and in schools of Nemom panchayat. A knowledge, attitude and practice survey on blood donation was also conducted among college students in collaboration with CACEE unit of a Kerala.

The Division of Cellular and Molecular Cardiology organized the **Annual conference of the**



Chief Minister Sri. AK. Antony inaugurates the annual national conference of Indian section of International Society for Heart Research



Professor Naranjan S. Dhalla delivers silver jubilee oration

International Society for Heart Research, Indian Section from Feb 1, 2002 to Feb 3, 2002. Chief Minister of Kerala, Sri. AK. Antony inaugurated the conference. Director General of Indian Council of Medical research, Prof. NK. Ganguly presided at the inaugural function. Twenty distinguished delegates from abroad participated in the conference. Several

symposia on frontier areas in cardiovascular research were held during the three-day conference.

A one-week **workshop on Dental Materials Testing** was conducted for MDS students in July 2001. This was organised by the DENTAL PRODUCTS Lab. The program comprised of 6 lectures on various aspects of dental materials by experts within the BMT Wing and 'hands-on' training for the students on testing of compressive strength, diametral tensile strength, microhardness, flexural strength, refractive index, water sorption and solubility.

A state level seminar on '**Animal experimentation in Biomedical Devices Development**' was organised on 11 August 2001, by Implant Biology Division.

Toxicology Division organized a one-day National Symposium on "**Perspectives on Animal Experimentation in Science and Education in India**".



His Excellency Justice Sukhdev Singh Kang inaugurates the Hindi Fortnight Celebrations

A Workshop for Protocol Development on Gender and Poverty Issues in Tuberculosis in WHO-SEARO Region was conducted. Dr. Manjula Datta, Head of the Department of Epidemiology, Dr. M.G.R. University, Tamil Nadu chaired the sessions.

During the alumni meet, on the occasion of the Silver Jubilee Celebration of the Institute, a **Workshop in Cardiac Interventions** was conducted by Department of Cardiology with the help of our past students. Dr. Sivakumar, Pediatric Cardiologist, at

AIMS Cochin demonstrated bioptome guided coil closure of very large patent ductus arteriosus and Dr. Rajpal performed coronary angiography by the radial artery approach.

SCTIMST participated in the SWADESHI VIJNANA MELA held at Cochin Jan 12-19, 2002. We also participated in the SWADESHI MELA at Cochin on behalf of TDB., N. Delhi from May 16 - 22, 2001. On both occasions SCTIMST biomedical exhibits were on display and was organized by Mr.D.Ranjit of the Technical Co-Ordination Cell.

EXTREMNALLY FUNDED RESEARCH PROJECTS

ACHUTHA MENON CENTRE

NEWLY INITIATED PROJECTS

Sl. No.	TITLE	PI	FUNDING AGENCY
1	Current status of service delivery in the health and family welfare sector in kerala	Dr.KR.TThankappan	Dir. of Health Service
2	Define/redefine the job responsibilities of various categories of employees and the Kerala Health Services	Dr.V.Mohanan Nair	Dir. of Health Service
3	Situational analysis of MTP services in Kerala: Provider Perspecive	Dr.Mala Ramanathan	AIIMS, New Delhi
4	Community based detection and monitoring of hypertension in kumarakom Panchayat, Kottayam	Dr.KR.TThankappan	Centre for Development Studies, TVM
5	Idle capacity in resource strapped in Govt. hospitals in Kerala	Dr.D.Varatharajan	WHO
6	Gender and Tuberculosis, STIs and HIV/AIDS in the WHO South East Asia region	Dr.TK.Sundari	WHO
7	Establishment on Sentinel Surveillance Systems in Indian Industry	Dr.KR.TThankappan	AIIMS, New Delhi
8	Workshop-study tour to Kerala of DHOs from Gujarat	Dr.D.Varatharajan	IIM, Ahmedabad
9	Control of CVDs and Diabetes in Kerala	Dr.KR.Thankappan	ICHDC, New Delhi
10	Gender and Social issues in Reproductive health	Dr.TK.Sundari	Ford Foundation
11	Political Decentralization & status of reproductive health in Kerala	Dr.Mala Ramanathan	Tide Foundation
12	Strengthening of Research in Health	Dr.KR.TThankappan	Tata Inst. Of Social Science

Sl. No.	TITLE	PI	FUNDING AGENCY
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COMPLETED PROJECTS

1	To build up institutional capacity for training in Gender & Public Health,develop a new proposal for engendering medical curriculam and conduct appropriate short term training programe	Dr.KR.TThankappan	Mac Arthur Foundation
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RUNNING PROJECTS

1	Public Helath Schools Without Walls	Dr.KR.Thankappan	Rockefeller Foundation
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HOSPITAL WING

NEWLY INITIATED PROJECTS

Sl. No.	TITLE	PI	FUNDING AGENCY
1	Indian Registry of Epilepsy & Pregnancy co-ordination	Dr.Sanjeev V Thomas	Indian Epilepsy Association
2	Health Awareness Programme	T VHemalatha	SBT, Trivandrum
3	Cognition & Behavioural Neurology Center (CBNC)	Dr.Mathuranath	SBT, Trivandrum & Indian Ladies Association Abudahbi
4	Trial of Zolmitriptan	Dr.Asha Kishore	Quintiles Spectral
5	A double blind, placebo controlled parallel group study to assess the efficacy safety and tolerability of BTS-74398 in patients	Dr.Asha Kishore	Quintiles Spectral
6	Detection and treatment of cancer using laser based techniques	Dr.A K Gupta	BRNS
7	European registry of Epilepsy and Pregnancy	Dr.Sanjeev V Thomas	European Registry
8	Blood Component Separation Unit at SCTIMST	Dr.Jaisy Mathai	National Aids Control Organisation
9	Neuronal Control of Cardiac growth: Does Substance P regulate Cardiac Fibroblast function	Dr.K.Shivakumar	DST. Gov. India
10	Estimating Prevalence and types of Dementia and Cognitive Impairment in Elderly Person	Dr.Mathuranath	Sri Ratan Tata Trust
11	Risk factor for Epilepsy: A population based case control study	Dr.K.Radhakrishnan	Indian Epilepsy Association

COMPLETED PROJECTS

Sl. No.	TITLE	PI	FUNDING AGENCY
1	Coconut oil & incidence of CAD in Kerala	Dr.K Subramonia Iyer	Coconut Development Board,GOI
2	Bilateral Subthalamotomy for advanced Parkinsons disease	Dr.Dileep Panicker	Pfizer Ltd.
3	Proposal for an open multicentre, multi national non comparative perspective study to evaluate the detach coil system.	Dr.Santhosh Joseph	M/S Cook Denmark
4	A multi center randomized, double blind placebo controlled parallel group, dose ranging study to assess the efficacy, safety and tolerability of escalating transdermal doses of STM-962 in subjects with early stage Parkinson's disease.	Dr.Asha Kishore	Quintiles Spectral

RUNNING PROJECTS

1	Physio antropometric study of the lower extremity of the Indian population	Dr.A K Gupta	Dr.Balu Shankaran, St.Stephedns Hospital, New Delhi
2	Clinical and genetic studies of parkinson's disease, parkinsonian syndromes and idiopathic dystonia in India	Dr.Asha Kishore	Kerala Transport Development Co-orporaton
3	Identification and characterization of protective antigens of mycobacterium tuberculosis	Dr.Muralidar Katti	STED
4	Project on improvement of voluntary blood donor base to Kerala research project scheme	Dr.Jaisy Mathew	Centre for development Studies

Sl. No.	TITLE	PI	FUNDING AGENCY
5	Antiviral & antifungal studies of indigenous medicinal plants of Western Ghats	Ms.Molly Antony	STED
6	Modulation of myocarmal contraction by sub-optimal level of extra cellular magnesium in free radical stress	Dr.R.Renuka Nair	DST, Gov.India
7	Investigation of serum and urinary mucopolyaccharides in patients with coronary artery and cerebrovascular disease	Dr.S.Sandhyamani	STED
8	Evaluation of cytokines in the pathogenesis and prognosis of Guiliane Barre Syndrome	Dr.V.V.Radhakrishnan	DBT
9	Vitamin D and its relationship to coronary artery disease in a tropical population	Dr.CC.Kartha	BRNS
10	Group interaction in psycho social care of epilepsey	Mr.Jayachandran	Indian Epilepsy Association
11	Does cerium activate endocardial endothelial Cells? (Molecular basis of endomyocardial fibrosis)	Dr.CC.Kartha	DST, Gov.India

BIOMEDICAL TECHNOLOGY WING**NEWLY INITIATED PROJECTS**

Sl. No	Principal Investigator/ Responsibility	Project Title	Funded By	Duration
1	Dr.C.PSharma	Stimuli sensitive polymeric nanoparticle based advanced drug delivery systems for cancer, diabetes and antibacterials	New millennium Indian technology leadership initiative of CSIR	2 years
2	Dr. Manoj Komath	Apatite calcium phosphate bone cements	STEC, Kerala	2 years

Completed projects

1	Dr.G.S. Bhuvaneshwar	Development of diamond like coatings for medical and other applications	New Delhi IFCPAR,	3 years
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Ongoing projects

1	Dr.T.Anoopkumar	Identification of the promoter region of human synaptotagmin 1 by 5' RACE	STEC, Kerala	3 years
2	Dr.Lissy Kalliyankrishnan	Experimental evaluation of endothelialized biomaterial for vascular implants	DST, Govt. of India	3 years
3	Dr.PPLizyomol	Development and biocompatibility studies of organically modified ceramic for medical applications	DST-SERC Fast tract young scientist scheme	3 years

Sl. No	Principal Investigator/ Responsibility	Project Title	Funded By	Duration
4	Dr.T.V. Kumari (supervisor of DBT fellow Bindu Menon)	Evaluation of biological response of hepatocytes to Certain polymeric biomaterials using in vitro culture systems	DBT, Govt. of India	2 years
5	Dr.T.V.Kumari	Osteogenic potential of biomaterials	SCTIMST Tech.Dev. Committee	2 years
6	D.S.Nagesh	Blood pump control & monitoring unit with disposable centrifugal pump head for extracorporeal cardiopulmonary bypass.	DST, Govt. of India	3 years
7	Dr.Prabha D.Nair	Biopolymers for medical applications	STEC, Kerala	3 years
8	Dr.P.Ramesh	Hydroxyapatite ethylene vinyl acetate copolymer composites for bone substitute applications	DST, Govt. of India	3.5 years
9	Dr.P.Ramesh	Development of non-toxic latex formulation for biomedical applications	DST, Govt.of India	3 years
10	Dr.P.Ramesh	Fabrication of clinically significant shapes of hydroxyapatite ethylene vinyl acetate composites for bone substitute application by special thermoforming techniques	DST, New Delhi	2 years

Industry sponsored projects

Sl. No	Project Title	Investigator	Funding agency	Duration Project	Status
1.	Biofunctional evaluation of an endovascular stent- preclinical evaluation in porcine model	Dr. Arthur Vijayan Lal	Sahajanand Technovention Gujarat	2 years	On going
2.	Development of a hollow fiber based membrane oxygenator	Dr. G.S. Bhavaneswar	SPIC Pharma Ltd. Madras	2.5 years	
3.	Dental Composite: Scale up and multi-centric evaluation	Dr.V. Kalliyankrishnan	Dynamic Orthopaedic Pvt. Ltd., Aluva	1 year	
4.	Drug trial for migraine	Dr. Asha Kishore	Astra Zeneca	1 year	Ongoing
5.	Heparinisation of IOL surfaces	Dr. K. Sreenivasan	Aurolab, Madurai	12 months	Ongoing
6.	Silverisation of wound dressing	Dr. K. Sreenivasan	Dynamic Orthopaedic Pvt. Ltd., Aluva	6 months	Completed
7.	Fibrin glue and sheet- scale up and multi-centric evaluation	Dr. Lizzy Kalliyana Krishnan	ATMRF, Ahmedabad	8 months	
8	Development of new sizes of TTK Chitra heat value	C.V. Muraleedharan	M/s TTK Healthcare Ltd Chennai	2 years	On going

SCIENTIFIC PUBLICATIONS

Book Chapters

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HONOURS AND AWARDS

Dr. Asha Kishore's paper "Sub thalamic surgeries for Parkinson's disease" was selected for the special certificate of the scientific committee for the best paper presented at the XIV International Symposium on Parkinson's disease-2001 held at Helsinki, Finland.

Dr. GS.Bhuvaneshwar was awarded the Material Research Society of India Medal for contributions to the field of Biomedical Engineering.

Dr. Jaisy Mathai won the III best poster award at 26th National ISBTI conference, Bangalore for the poster "Transfusion Associated Hepatitis- A Cause for Concern".

Dr. TV.Kumari received the Mahe Award at the National conference of Society for Biomaterials & Artificial organs (India) held at IIT, Chennai.

Dr. PPLizymol and Dr.VKalliyana Krishnan won the best paper award in Medical Sciences Category at the XIV Kerala Science Congress for their paper 'Synthesis and characterization of three novel urethane tetramethacrylate resins for dental applications'.

Dr. Lizymol also received the Young Scientist Award.

Dr. A.Maya Nandkumar received the best poster award for the poster titled " Lung cell sheets from temperature responsive dishes - an ideal candidate for lung tissue construct " at the Engineering Tissue Growth 2002 conference at Pittsburg, Pennsylvania.

Dr. BJ. Rajesh was conferred the best paper award for his paper "Clinico-pathological study of Cerebral aneurysms" at the National conference held at Mumbai in December 2001.

Dr. S.Sandhyamani was elected as a Fellow of National Academy of Medical Sciences (FAMS).

AT. Shefi, PV. Sunita and CP Sharma won for their paper "Betacyclodextrin complexed insulin loaded alginate microspheres – Oral delivery system" the Bajpai-Saha award for the best paper presentation, at the XII National Conference of Society for Biomaterials and Artificial Organs India, held at IIT Madras.

Ms. Shiny Velayudhan received first prize for the paper “Polymers in Medical Applications – State of Art” in the Golden Jubilee Essay Competition held at I.I.T. Kharagpur.

R. Sreekumar, S.Suresh Babu and HK.Varma won for their poster “Biomimetic growth of Calcium Phosphate over Silica sol incorporated Chitosan Films”, the best poster award at Conference on Electron Microscopy and Allied Fields held at Mumbai.

Dr. Suresh Nair and Dr.Rajneesh Kachhara were awarded best paper award at the IVth Asian Oceanian Skull Base Surgery meeting held at Tokyo, in November 2001.

Any other items

Dr. Amar Jesani was appointed member of the Institutional Ethics Committee for the Collaborative Research Projects of Samraksha/Samuha (Bangalore) and University of California, San Francisco, funded by NIH and others. He was also appointed member of the Selection Committee for the Leadership Development Fellowship Programme of the MacArthur Foundation, New Delhi.

Dr. TV.Anilkumar was appointed as a ‘Nominee’ of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA: Government of India) to the Institutional Animal Ethics Committees at Rajiv Gandhi Centre for Biotechnology (Trivandrum) and Kerala Agricultural University (Thrissur).

Dr. Mala Ramanathan was a Member of the Core Group for curriculum development and training for the Ford Foundation funded short course on Gender, Health and Development conducted by SAKHI Women’s Resource Centre, Trivandrum. She was also a Temporary Consultant to the Adolescent Health Department, WHO, Geneva for consultation on Regulation.

Dr. V. Mohanan Nair was a member of the expert committee constituted by the Government of Kerala for drafting the State Health Policy. He was nominated by the Government of Kerala as a Member of the Project Supporting Cell in the Directorate of Health Services to enhance its technical capacity under the European Commission supported Sector Investment Programme (ECSIP) in the state. He is also a member of the expert committee constituted by the Kerala State branch of Indian Medical Association, to draft a “Health Policy document” to be submitted to the government.

Dr. D.Varatharajan became a member of Board of Studies for Master of Applied Epidemiology course under Field Epidemiology Training Programme (FETP) at National Institute of Epidemiology (ICMR), Chennai.

Mr. K.Vijayakumar served as a technical expert for purchase of equipments for Medical Colleges in Kerala. He also served as a member of Board of Studies and Faculty in CUSAT, Kerala State Council for Vocational Training and Electro-Medical Equipments Sectional Committee of Bureau of Indian Standards.

VISITORS

Mr. Alain Martinez, a French consultant on quality systems visited the BMT wing from 28th May to 1st June 2001. He visited the various laboratories and carried out an assessment of the quality system implemented and preparedness for final audit.

Dr. Charles Polky, Professor of Neurosurgery, King's College, London U.K, visited the Department of Neurosurgery and R.Madhavan Nayar Center for Comprehensive Epilepsy Care from December 11 to 15th. He had a series of clinical discussions with the faculty and delivered the lecture, 'Recent advances on epilepsy surgery'.

Dr. David Chadwick, Professor of Neurology, University of Liverpool, U.K, visited the R.Madhavan Nayar Center for Comprehensive Epilepsy Care on December 9 and 10. He had a series of clinical discussions with the faculty, and delivered the lecture 'Head injury and epilepsy'.

Sir. Harry Caton, Chairman of Alzheimer's Society, UK, visited the CBNC in November 2001.

Dr.Hema Balaram, Faculty fellow, Molecular and Genetics Unit, JNCASR, Bangalore spent four days in the division of Cellular & Molecular Cardiology and demonstrated various molecular biology techniques to students.

Prof. Dr. Ing. K. Friedrich, Research Director, Institute of Composite Materials Ltd. (IVW), University of Kaiserslautern, Germany, visited the laboratory during December 2001, in connection with the ongoing Indo-German (DST-DAAD) joint-research programme. He delivered a lecture on 'Polymer Composites Research at IVW, University of Kaiserslautern'.

Prof. Jayaprakash Muliyl, Community Health Dept. Christian Medical College, Vellore, Dr. Srinath Reddy, AIIMS, New Delhi, Dr. Mark Nichter, department of Anthropology, University of Arizona, USA, Prof. Robert Beaglehole, University of Auckland, Newzealand, Prof. Richard A.Cash, Harvard School of Public Health, Boston, USA and Prof. Arthur Reingold, Division of Epidemiology, School of Public Health, University of California, Berkeley, USA visited Achutha Menon Center and taught the MPH students.

Mr. Juergen Hoffmanna, PhD student, Institute for Composite Materials Ltd. (IVW), University of Kaiserslautern, Kaiserslautern, Germany, AAD), visited in connection

with the on-going Indo-German (DST-DAAD) joint project laboratory during February 2002. He delivered a lecture on 'Some Polymer Composites in Medical Applications'.

Dr. Kailash Bhatia, Consultant Neurologist, National Hospital, Queen Square, London, visited the department of Neurology and delivered a lecture on 'Movement disorders' and showed interesting videos.

Prof. NC.Nayak, Emeritus Professor, AIIMS and Prof. Indira Nath, INSA SN Bose Research Professor, AIIMS, the review team of IFPCAR visited BMT Wing during April 2001 for monitoring biological experiments In connection with the Indo-French collaborative project, "Development of Diamond like Coatings for Biomedical and other Applications".

Prof. Peter Berman, Harvard School of Public Health, Boston, USA visited the centre to explore the potential collaboration for research activities with this centre.

Dr. R.Suryanarayanan of Laboratoire de Chimie des Solides, University of Paris-sud, France visited Artificial Organs division in January 2001 for discussions on various aspects of the project implementation.

Mr. Stefan Schmitt, Engineer, Institute for Composites Materials Ltd. (IVW), University of Kaiserslautern, Kaiserslautern, Germany, visited the laboratory during

February 2002 as part of the on-going Indo-German (DST-DAAD) joint project. Mr. Stefan Schmitt delivered a lecture on 'An Introduction to Atomic Force Microscopy'.

Mr. Yuan Sampeur, (Director ICMC and Industrial partner in the project) visited the Artificial Organs laboratory during Jan/ Feb 2001 for discussion on the progress of the project and future course of action.

Other visitors to the Achutha Menon Center were: Dr. Khalilullah, Regional Fellowship Officer, WHO, New Delhi, Dr. Robert j. Kim-Farley, WHO Representative to India, New Delhi, a group of WHO Fellows from Bangladesh, Dr. Jean-Frederic Levesque, University of Montreal, Canada, and Dr. Ravi Duggal, Co-ordinator, CEHAT, Mumbai.

Delegates from European Commission visited the centre to explore the possibilities for Short Term training programmes in different disciplines.

The second TN Krishnan Memorial Lecture was conducted. Prof. Srinath Reddy, AIIMS, New Delhi gave a lecture on "Providing a Public Health Response to the Cardiovascular Diseases Epidemic in India". The third TN Krishnan Memorial Lecture was given by Dr. Dilip Mavalankar, IIM, Ahmedabad on "Policy Barriers Preventing Access to Emergency Obstetric Care in Rural India".

VISITS ABROAD OF FACULTY

Dr. Asha Kishore presented the paper “Subthalamic surgeries for Parkinson’s disease” at the XIV International Symposium on Parkinson’s disease-2001 at Helsinki, Finland. She also visited the Deep Brain Stimulation program at the University of Grenoble, France and attended the investigators’ meeting for the drug trial on early Parkinson’s disease at Brussels.

Dr. RN.Bhattacharya attended the “5th investigator meeting, STICH, on Wednesday 25th April 2001”, held at New Castle Upon Tyne, United Kingdom. He has also attended the conference of “ Society of British Neurological Surgeons – Spring 2001” on 25th- 27th April, at New Castle Upon Tyne, United Kingdom. He visited “ Klinikum der Erast – Moritz – universitat, Greifswald, Germany as visiting faculty for one week in November 2001. He visited department of Neurosurgery at university medical center St Radboud, Nijmegen, Netherlands as visiting professor in November 2001. He also attended the “ 12th World Congress of Neurological Society” held at Sydney in 15th – 20th September 2001.

Dr. GS.Bhuvaneshwar visited France in August 2001 for discussions with the French Collaborators and preparation of the final report on of the Indo-French project. He also visited Havana, Cuba, as a team member of the Indian Sc. & Tech. team for the Indo-Cuban work shop on “Biomedical Technology and Instrumentation: Institution-Industry Meet”, from 25-29 October 2001.

Dr. K.Mohandas attended the “Networking for Public Health Capacity- African Meeting held at the University of Pretoria, South Africa from 5 to 8 April 2001. He was an invited faculty at the workshop on “Ethical Issues of Health Research in Developing Countries” held at Aga Khan University in July 2001. He attended the “Introductory Workshop for Master of Public Health Programme” as an invitee of the Chairman, University Grants Commission, Sri Lanka and the meeting of all heads of departments of Community Medicine, Medical Colleges, Sri Lanka in November 2001. He attended the “Non-communicable Disease Research Partners Meeting” organized by the WHO, Geneva in December 2001. He also attended the council meeting of the Association of Commonwealth Universities, in March 2002, representing Indian universities.

Dr. Niranjana D. Khambete visited Department of Medical Physics and Clinical Engineering, The University of Sheffield, UK and Northern Ireland Bioengineering Centre, The University of Ulster at Jordanstown, UK. for exploring possibilities of collaborative research activity with these institutions.

Dr. K.Radhakrishnan participated in the XVII World Congress of Neurology, London, U.K, June 17-22 and presented a paper titled 'Epilepsy Surgery in Developing Countries

Dr. P.Ramesh visited Institute for Composite Materials, University of Kaiserslautern, Germany, during July 15th to August 12th, 2001 as part of the on-going Indo-German (DST-DAAD) joint research programme.

Dr. P.Sankara Sarma participated in the meeting of Asia & Pacific Forum for Health Research titled 'A three-day intensive exchange plus post-meeting dialogue to synergize global and national health research system', at Bali, Indonesia during 13-15, November 2001.

Dr. K.Sreenivasan visited Biofunctional Ceramic research Group of Ceramic Research Institute, AIST, Nagoya, Japan from March 2, 2002 to March 20, 2003 as a guest researcher.

Dr. N. Suresh Nair and Dr. Rajneesh were invited faculties at "Hygo Heart and Brain center" at Himoji and Nagoya university school of medicine, Nagoya and had given lectures. Dr. Suresh Nair delivered a lecture on "Spinal Intramedullary tumours" and Dr. Rajneesh Kachhara has delivered on "Transbasal approaches to Skull base".

Dr. KR.Thankappan participated in the Wellcome Trust-WHO consultation on secondary prevention of Major Noncommunicable Diseases in Low-and Middle-income Countries 1-3 August 2001, Hinxton Hall, Cambridge UK, visited WHO India country office and SERO office as part of collaboration activities During November 5-7, 2001.

Dr. HK.Varma visited Institute fur Verbundwerkstoffe (Institute for Composite materials), University of Kaiserslautern, Germany from 14th July to 10th August 2001, in connection with the DST-DAAD Scientific Collaborative Programme on hydroxyapatite polymer composite system. He gave a talk on Bioceramic Materials as Hard Tissue Prostheses on 5th August 2001 at Verbundwerkstoffe (Institute for Composite materials), University of Kaiserslautern, Germany.

Dr. D.Varatharajan visited The Philippines in connection with the project on 'Idle capacity in resource strapped govt. hospitals in Kerala'.

VISITS ABROAD OF FACULTY FOR TRAINING

Dr. Annie John completed a two-year Postdoctoral programme in Tissue engineering at Kyoto University under the Japan Society For The Promotion of Science (JSPS) postdoctoral fellowship for foreign researchers (1999-2001).

Dr. AK.Gupta and Dr.Santhosh Joseph attended a training programme in CT & MRI at USA and Interventional Neuroradiology programme at Argentina in April 2001.

Dr. C.Kesavadas went to Scientific Institute and University Hospital, San Raffaele Milan, Italy for study and Training in Functional MR Neuro imaging under BOYSCAST Fellowship for a period of one year from 26 March 2001 to 20 March 2002.

Dr. Malla Bhaskara Rao was a Visiting Fellow, at Department of Neurosurgery, Austin & Repatriation Medical Centre, Melbourne, Australia, during March-September 2000 and a Clinical Fellow at Department of Neurosurgery, King's College Hospital, London from September 2000 to September 2001.

Dr. Niranjana D. Khambete was awarded David Fussey Alumni Fellowship by the Association of Commonwealth Universities, UK.

Dr. Mala Ramanathan participated in the Public Health Schools without Walls Network Development: Asia Meeting, 5-6 April, 2001 at the University of Pretoria, Pretoria, South Africa. Undergone advanced training at the Amsterdam Masters in Medical Anthropology for a special course on Culture, Care, Chronic Illness and Disability.

Dr. S. Sivasankaran proceeded to United Kingdom to avail a Commonwealth Fellowship for training in paediatric cardiology.

International Conferences Attended by Staff

Name of the conference	Venue & Date	Name of the speaker	Title of paper
6 th Meeting of World Society for Microelectrode Recording	Adelide, September 2001	Dr. Dilip Panikkar	–
Annual conference of American Society of Neuroradiology	April 2001	Dr. AK. Gupta Dr. Santhosh Jospeh	
14 th World Congress on International Society of Laser Surgery and Medicine	Chennai, August 2001	Dr.AK. Gupta Dr.AK. Gupta	Early clinical report on percutaneous Laser disc decompression Interstitial Laser photocoagulation of osteoid osteoma-a case report
XVII World Congress of the International Society for Heart Research	Winnipeg, Canada July 2001	Dr. CC. Kartha (invited speaker)	Vitamin D and atherosclerosis: a noteworthy link
15 th Biennial Congress of the Association of Cardiovascular and Thoracic Surgeons of Asia	Mumbai, December 2001	Dr. SR. Krishna Manohar Dr. KS. Neelakandhan Dr. R. Sankar Kumar	Submitral aneurysm repair-Chitra experience Management of complicated descending thoracic aortic aneurysms Chitra heart valve-midterm results of multicentric trial
12 th Congress of the World Federation of Neurological Societies	Sydney Australia	Dr. Dileep Panikkar Dr. Rajneesh Kachhara Dr. Suresh Nair	– – –
7 th National Conference of Alzheimer's and Related Disorders Society of India	Ottawa November, 2001	Dr. PS. Mathuranath	Instrumental activities of daily living in the elderly
XVII World Congress of Neurology	London, UK June 2001	Dr.K. Radhakrishnan	Epilepsy surgery in developing countries

Name of the conference	Venue & Date	Name of the speaker	Title of paper
IVth Asian Oceanian Skull Base Surgery meeting	Tokyo November 2001	Dr. Rajneesh Kachhara Dr. Suresh Nair	Anterior clinoidal meningiomas: results and outcome Extended transbasal approaches to sphenopetroclival lesions Meckles cave meningioma- Report of two cases Posterior petrous meningiomas, Foramen magnum meningiomas, Cystic Vestibular schwannomas, Does hearing preservation really benefit patients with large Vestibular schwannoma, acoustic neurinomas, and Paragangliomas of skull base
Networking for Public health capacity-Africa meeting	Pretoria, South Africa April 2001	Dr. K.R. Thankappan	Public health Schools network development in Asia region
Global forum for health research, forum 5.	Geneva, October 2001 Colombo, November 2001		Research projects on cardiovascular diseases at the Achuth Menon Centre for Health Science studies Public health schools without walls
European Congress of extracorporeal circulation technology	Killarney, Ireland June 2001	Mr. Thomas Maliakal	Cerebro-myocardial protection in aortic arch aneurysm repairs under CPB

National conferences

Name of the conference	Venue & Date	Name of the speaker	Title of paper
Neurological Society of India Neurocon 2001	December, 2001	Dr. Ahsan Moosa	Intracranial sinovenous thrombosis-Clinical characteristics and outcome
34 th Annual convention of Indian Speech and Hearing Association	New Delhi February 2002	Mrs. Annamma George	The effect of age, education and gender on verbal fluency tasks.
National Seminar on Processing, Characterisation and Applications Light Structural materials for Frontier Sectors	Trivandrum February, 2002	Dr. Annie John	Biological evaluation of hydroxyapatite and bioactive glass system granules for hard tissue application
28 th Annual meeting of Indian Immunological Society	New Delhi October 2001	Dr. PS. Appukkuttan	Naturally occurring dextran-binding immunoglobulins with multiple sugar specificity detected in human plasma
Frontiers in Biochemistry and Biotechnology	CMC Vellore January 2002		Carbohydrate-binding antibodies in human plasma: more recognitions recognized
6 th National conference on Movement Disorder	Mumbai	Dr. Asha Kishore	Invited scientific faculty
International conference on Movement Disorders	Chennai		—
3 rd Skull base society of India conference	Chennai October 2001	Dr.RN.Bhattacharya	Supraorbital key hole approaches
Annual conference of Neurological Society of India	Mumbai December 2001		—
5 th Indian Society of Stereotactic and functional Neurosurgery	Ahmedabad November 2001	Dr. Dilip Panikar	STN lesions in Parkinson's disease

Name of the conference	Venue & Date	Name of the speaker	Title of paper
Annual conference of Neurological Society of India	December, 2001	Dr. AK. Gupta	Coil embolization for intracranial aneurysm
		Dr. Santhosh Joseph	Role of interventional radiology in management of cerebral dural AV fistula
54 th National conference of Cardiological Society of India	Hyderabad December, 2001	Dr. S. Harikrishnan	Ventricular septal rupture: clinical and hemodynamic profile, surgical results and long term outcome Right-Sided cardiac masses: profile, surgical outcome and follow-up
		Dr.KM. Krishna-moorthy	Supravalvar aortic stenosis: clinical hemodynamic profile and surgical outcome Follow-up of patients with severe aortic regurgitation considered not to require surgery Time taken for trans-septal left atrial entry during repeat balloon mitral valvuloplasty 139 transesophageal echocardiography is not required in all patients prior to balloon mitral valvuloplasty Efect of pulmonary artery hypertension on right ventricular TEI index before and after balloon valvuloplasty

Name of the conference	Venue & Date	Name of the speaker	Title of paper
			Balloon sizing of atrial septal defects: its reproducibility and relation to echocardiographic size
National Laser Symposium	Indore December, 2001	Dr. K.S. Neelakandhan	Laser treatment for the treatment of the lesions of tracheobronchial tree
		Dr. AK. Gupta	Percutaneous ablation of osteoid osteoma using YAG laser
			PLDD-Clinical experience and long term follow up
		Mrs. RS. Jayasree	Efect of combination of He-Ne laser and Nd:YAG laser and 5-Aminoleuvulinic acid on solid tumour in mice
			Characterisation of a sub mandibular sialolith
Annual Conference of IRIA	January, 2002	Dr. AK. Gupta	Interventional Neuroradiology Perspective
			Spinal AVM – role of interventional radiology
			SAH – of unknown origin
			coiling of Aneurysm
4 th Annual Conference of ISVIR & ISNR	Mumbai December, 2001	Dr. AK. Gupta	Coil embolization for intracranial aneurysm – SCTIMST experience
			Spanial arteriovenous malformation – role of interventional radiology
		Dr.Santhosh Jospheh	Cerebral dural arteriovenous fistula – role of intervention
		Dr.TR. Kapilamoorthy	–

Name of the conference	Venue & Date	Name of the speaker	Title of paper
		Dr. Sharma Rao	Intraarterial thrombolysis in stroke and procedure related complications
26 th National Conference of ISBTI	Bangalore	Dr. Jaisy Mathai	Transfusion associated hepatitis- a cause for concern
		Dr. PV. Sulochana	Blood usage in CABG – a comparative analysis
12 th National Conference of the Society for Biomaterials and Artificial Organs- India	Chennai November, 2001	Dr. Jayabalan	Biodegradable bone cements
International Seminar – Plastic testing –2001	Chennai December, 2001		Evaluation of Polymeric Biomaterials Using Simulated Tests For Biomedical Applications
Annual Meeting of the Indian Academy of Sciences	Thirupati November, 2001	Dr. Jayakrishnan	Immobile plasticizer in flexible PVC
National Seminar organized by the Materials Research Society of India	Trivandrum April, 2001		Seize the day: Innovate or Perish
Annual conference of International Society for heart research-Indian section	Trivandrum February, 2002	Dr. N. Jayakumari	Modification of amino acid side-chains in proteins during myocardial reperfusion by coronary angioplasty
First Annual Congress of Interventional Cardiology	Mumbai, May, 2001	Dr. Kapilamoorthy	Imaging femero popliteal interventions in limb salvage supra aortic interventions
CMR Institute of Management studies	Bangalore	Dr. MK. Katti	Immunodiagnostic approaches for diagnosis of chronic infections of the CNS

Name of the conference	Venue & Date	Name of the speaker	Title of paper
28 th Annual Conference of Indian Immunology Society	New Delhi October, 2001		Clinical evaluation of antibody responses to antigens of M.tuberculosis and C.cellulosae in CSF of chronic infections of the CNS by passive haemagglutination assay and their characterization by immunoblot assay
1 st Annual Conference of Biotechnology Society	New Delhi October, 2001		A novel erythrocyte based immunoassay for antibody simultaneous detection of both and circulating antigen in human sera of pulmonary tuberculosis patients.
48 th annual Conference of the Indian Association of Cardiovascular and Thoracic Surgeons	Chennai February, 2002	Dr.SR. Krishna Manohar	Intracardiac conduit Fontain in hearts with small right atrium and superior vena cava
		Dr. KS.Neelakandan	
		Dr. R. Sankar Kumar	Chitra heart valve-results of multicentric trial
		Dr. KG. Shyam-krishnan	Corrected transposition with associated cardiac defects-surgical management and follow-up.
Faculty seminar in NKCDS	Bhubaneshwar September, 2001	Dr. Mala Ramanathan	Providers perspective of quality of services in the family welfare programme: a case study of Orissa State

Name of the conference	Venue & Date	Name of the speaker	Title of paper
XXV Annual Conference of the Indian Association for the Study of Population at the IIPS	Mumbai February, 2002		Reproductive and child health Critical review of reproductive health issues in Kerala.
Faculty seminar Series of the International Institute of Population Sciences	Mumbai February, 2002		Critical review of reproductive health research in India during the 90's
National Symposium on Medical Textiles	Chennai July 2001	CV. Muraleedharan	Sitra-Chitra vascular graft prosthesis
50 th Annual conference of Neurological Society of India	Mumbai	Dr. MD. Nair	Mitochondrial and lipid storage myopathy- a clinical study
Annual conference of ISNACC 3	Mumbai January 2002	Dr. PK. Neema	Carotid endarterectomy
		Dr.Raghunath Nalgirkar	Anesthetic management of Diencephalic Syndrome: a case report
Annual conference of Indian Society of Anaesthesiologists	Ahmedabad December 2001	Dr. PK. Neema	Inadvertent interruption of descending thoracic aorta during VSD closure and PDA ligation- recognition and consequences.
		Dr. S. Rupa	Invited lecture- Pulse oximeter Visero-renal anastomosis for management of Reno vascular hypertension. Airway management during surgery on trachea. Invited lecture- Pharmacological brain protection and pharmacotherapy of seizures

Name of the conference	Venue & Date	Name of the speaker	Title of paper
		Dr. V.G. Srinivas	Invited lecture- Pharmacological manupulation of myocardial contractility and vascular tone Perioperative management of dysphagia lusoria
II International clinic of Neurological surgery	New Delhi September 2001	Dr. S. Parameswaran	Gliomas: SCTIMST experience
Golden Jubilee Conference of Neurological Society of India	Mumbai 2001	Dr. VV. Radhakrishnan	Immuncytochemical demonstration of myobacterial antigens in cerebrospinal fluid of patients with tuberculous meningitis
Annual conference of Indian Academy Neurology	New Delhi September 2001		Nemaline myopathy
7 th International Conference of Surgical Pathology	Trivandrum January, 2002		Pituitary Tumor current concepts
Second Joint Conference of Indian Epilepsy Association and Indian Epilepsy Society	Mumbai December, 2001	Dr. K. Radhakrishnan	Seizures semiology and classification and long term Video-EEG monitoring in a developing country set-up.
		Dr. Joseph Cherian	Assessment of the role of the intracarotid Amobarbital procedure (Wada test) in the presurgical evaluation of patients with refractory temporal lobe epilepsy
		Dr. PN. Sylaja	Seizure outcome after temporal lobectomy in patients with normal MRI

Name of the conference	Venue & Date	Name of the speaker	Title of paper
		Mr. Jayachandran	Knowledge, attitude and practice, quality of life and satisfaction of patients with epilepsy attending a comprehensive epilepsy programme.
Annual conference of Neurological Society of India	Mumabi December 2001	Dr. Rajneesh Kachhara	Olfactory groove meningiomas and Meckle's cave meningiomas
3 rd Skull Base society of India conference	Chennai October, 2001	Dr. Ravimohan Rao	Paragangliomas of the skull base
5 th Indian society of Sterotatic and functional Neurosurgery	Ahmedabad November, 2001		Hemispherectomies: Indications, techniques and results
Paediatric neurology national conference	Trivandrum April, 2001		Paediatric CVJ anomalies
International conference on Biomedical Engineering (Bivision 2001)	Bangalore December, 2001	Dr. Roy Joseph	–
Annual conference of the society of Indian Neuro Science Nurses			–
Conference of Indian Epilepsy Association and Indian Epilepsy Society	Mumbai December, 2001	Mrs. PP Saramma	Parenting issues of mothers with Epilepsy
5 th annual conference of IACTA	Bangalore November, 2001	Dr. Reghunath Nalgirkar Dr. S. Rupa	CPB and deep hypothermia total circulatory arrest for Neurosurgery Aortic arch aneurysm A simple technique of distlal perfusion during aortocarotid bypass surgery Treatment of radial artery spasm

Name of the conference	Venue & Date	Name of the speaker	Title of paper
		Dr. VG. Srinivas	Cardiotomy retrieval system for aortic surgery: our experience of 25 cases over 3 years
		Dr.PK.Neema	How often ACT should be done in patients undergoing open heart surgical procedures
Annual conference of the International Society of Heat Research Indian section	Trivandrum February, 2002	Dr. Renuka Nair	Age dependent variation in mechanical response of adult rat cardiomyocytes to marginal magnesium deficiency.
Annual Conference of the Indian Society of Human Genetics			Genetic liability to epilepsy in Keralites
Annual Conference of Vascular Society of India	Pune November, 2001	Dr. PV. Santhosh	Post Cath pseudoaneurysm & groin hematoma – The need for proper compression & technique
		Dr. Bejoy Thomas	Percutaneous Transluminal Angioplasty & Stenting in Renal Artery Stenosis
25 th Annual EMSI Conference on Electron Microscope and Allied Fields	Mumbai February 2002	Mr. R. Sreekumar	Biomimetic growth of calcium phosphate over silica sol incorporated Chitosan films
Neurocon 2001	December, 2001	Dr. Shylaja	Intracranial sinovenous thrombosis simulating idiopathic intracranial hypertension.

Name of the conference	Venue & Date	Name of the speaker	Title of paper
3 rd Skull Base Society of India conference	Chennai October 2001	Dr. Suresh Nair	Cystic acoustic schwannomas
Annual conference of Neurological Society of India	Mumbai December 2001		–
AVBD Conference on Blood Donor Motivation	Chennai April, 2001	Mrs. Usha Kandaswamy	
ISBTI conference	Bangalore February 2001		Blood donor recruitment for rural population
8 th National conference of the Vascular Society of India	Pune December, 2001	Dr. M. Unnikrishnan	Recent experience with thoracoabdominal aneurysm surgery at Sree Chitra Short term follow up with carotid endarterectomy

Regional Conferences

Name of the conference	Venue & Date	Name of the speaker	Title of paper
Indian Psychiatric Society, South Zone Conference	Trichur October, 2001	Dr. PS. Mathuranath	Screening instruments for cognitive impairment
Southern Regional conference of Indian Pharmacology Society	MCH, Trivandrum	Ms. Molly Antony	Screening of selected medicinal plant extracts for their anti-polio virus activity
7 th South Zone	SCTIMST, Trivandrum 2001	Dr. Jaisy Mathai Dr. PV. Sulochana	QA for blood safety QC of Reagents & Kit
XVII South Zone conference Anesthesiology	Mysore October, 2001	Dr. PK. Neema	Anesthesia & myasthenia gravis
Regional Neurology meeting	Mangalore October, 2001	Dr. K. Radhakrishnan	Medically refractory epilepsy

Name of the conference	Venue & Date	Name of the speaker	Title of paper
Southern chapter Conference of the Pharmacological Society of India	MCH, Trivandrum	Dr. K. Radhakrishnan	–
Annual API, South Zone conference	Cochin July, 2001	Dr. Sarada	Demeylinating Polyneuropathies-clinical profile and management strategies
Southern Chapter of Indian Society of Nephrology	Tirupathy February, 2001	Dr. M. Unnikrishnan	Surgical experience with reno-vascular hypertension
South Zone Drug Inspectors Training Programme	June, 2002	Ms. Usha Kandaswamy	Blood Donor Motivation

State level conferences

Tamil Nadu State Annual conference of Indian Society of Anaestheologist	Erode July, 2001	Dr. Thomas Koshy	Anesthetic management of coronary artery disease patient coming for non-cardiac surgery
IRIA (Kerala Chapter) Annual Conference	Cochin March, 2002	Dr. Bejoy Thomas	Percutaneous vertebroplasty
25 th Social Science Congress	Kerala University, Trivandrum	Mr. Jayachandran	Group interventions in psycho-social care of epilepsy
Kerala State Blood Transfusion Council -Review meeting of Blood Bank Officers -Review meeting for Technicians Technical session of HLL	Trivandrum	Dr. Jaisy Mathai Dr. Jaisy Mathai Dr. PV. Sulochana	Voluntary blood donation Blood storage and transportation QC of blood components Adverse effects of blood transfusion

Name of the conference	Venue & Date	Name of the speaker	Title of paper
Seminar organized by the Science, Technology and Environment, Government of Kerala	Trivandrum April, 2001	Dr. Jayakrishnan	Seize the Day: Innovate or Perish
Annual Conference of Neurological Society of India, Kerala Chapter	Trivandrum February, 2002	Dr. PS. Mathuranath	Classification and approach to dementia
Trichur Neuroclub/IMA	Trichur	Dr. MD. Nair	Thrombolytic therapy in ischemic stroke
Dept. of Neurology, MCH, Trivandrum	Trivandrum		Myasthenia gravis- a critical care approach
NSI Kerala Chapter	Trivandrum February, 2002	Dr. Ravimohan Rao	Acoustic schwannomas Surgical treatment
Kerala Chapter of Indian Society of Anaesthesiologist	Trivandrum October, 2001	Dr. S. Rupa	Sevoflurane- recent trends in ventricular care approach
		Dr. VG. Sreenivasan	Pulse oximeter and capnography
Trivandrum Neuroclub meeting	Trivandrum March, 2002	Dr. Sylaja	Management of epilepsy in women
Kerala State annual conference of ISA	Trivandrum October, 2001	Dr. Thomas Koshy	Anatomic and physiological consideration in neuroanesthesiology
Nursing Training Programme	Trivandrum, SCTIMST	Mrs. Usha Kandaswamy	Voluntary blood donation
Seminar on Health Sector and decentralization in Kerala	Trivandrum July, 2001	Dr.D.Varatharajan	Strengthening PHCs through panchayati raj
Seminar on Political decentralization in Kerala	Thrissur July, 2001		

Participation of Staff in Workshops, Meetings and CME

Dr.Ahsan Moosa NV attended the First National Workshop on ‘Critical Care Neurology’, held at Hyderabad, March 2002.

Dr. Amar Jesani, attended a training workshop on “Ethics in Bio-medical Research”, organised jointly by the Forum for Medical Ethics Society (Mumbai), Department of Community Medicine, Medical College, Trivandrum and Kerala Health Studies and Research Centre, Trivandrum. He conducted the training session on “Ethics in Collaborative Research”. He also attended a meeting for the release of theme issue on “Women and Health” of the journal, Samyukta, published by the Women’s Initiative. He presented a review of the theme issue at the function in the Press Club. He attended the meeting of the Institutional Ethics Committee, Samraksha, Bangalore, selection committee meeting of MacArthur Foundation, New Delhi, consultation meeting to discuss the National Report/Study titled, “Mapping Human Rights in India”, participated in the National Consultation on “Gender and Medical Education” organised by AMCHSS/SCTIMST and CEHAT, Mumbai. He attended an Indo-German Seminar on Bio-Ethics, organised by the Indian Council of Medical Research, New Delhi at Lonavala.

Dr. Annie John was a guest faculty for University/ College Teachers Refresher course in Life Science - UGC-Academic Staff College, University of Kerala. She spoke on ‘Electron microscopy and Tissue engineering’. She was a Guest Professor on Biomaterials Science for the M.Tech. Programme in the School of Medical Science and Technology, IIT Kharagpur.

S.Balram attended the Laboratory Assessor course organized by National Accreditation Board for Testing and calibration Laboratories (NABL) at Indian Institute of Quality Management, Jaipur in December 2001. He was empanelled as a laboratory assessor by NABL

Gracy Varghese and Molly Antony attended a workshop on “Establishment of reference laboratories and networks for monitoring Antimicrobial resistance in India” at Christian Medical College, Vellore.

Dr. AK.Gupta participated in the CME Programme on Peripheral Vascular Diseases at Christian Medical College, Vellore. He spoke on Peripheral angioplasty. He attended a Workshop & CME in International Radiology at Nizams Institute, Hyderabad and spoke on Management of Dural Fistula. He also attended a Laser & PLDD Workshop at Chennai and a Workshop & CME in Interventional neuroradiology at Research & Referral Hospital, New Delhi. He spoke on Interventional Radiology in Management of Cerebrovascular Disease at the Annual celebration of Gauhati Neurological Institute, Gauhati.

Dr. Jaisy Mathai attended workshops on ‘Blood Group Serology’ and ‘Lab diagnosis and management of Bleeding Disorders’ at Bangalore. She as a Technical Resource Group Member participated in the workshop arranged by NACO for preparation of Guidelines for Best Practices Document in Blood Transfusion Services.

Mr. Jayachandran attended the ‘International Workshop on Group Psychotherapy’ in Mumbai organized by Mumbai Psychological Association.

PKrishnamoorthia Pillai delivered lectures on “ Role of Medical Records in Hospital Management, Medical Certification of Cause of Death and Medical

Audit at the CME program at Alleppey Medical College.

S.Jayaprabha and Sudha attended the IASLIC 23rd All India Conference conducted by Indian Association of Special Libraries and Information Centre (IASLIC), Calcutta at University of Kerala, Thiruvananthapuram in December 2001.

Dr. PPLizymol participated in a Two- day workshop on 'Advanced Polymer Composites' held by Regional Research Laboratory, Trivandrum.

Dr. Mala Ramanathan participated and presented a paper 'Review of research in reproductive health' at the Reproductive Health Research Review Dissemination Workshop held between December 4-5, 2001 at the YWCA, Asha Kiran, Mumbai. She also participated and presented a paper 'Critical Review of Research in Maternal Mortality and Morbidity in the period 1990-1999 at a workshop on 'Determinants of Maternal Mortality in Andhra Pradesh' held between 14-15th December, 2001 at the Centre for Economic and Social Studies, Hyderabad. Dr. Mala Ramanathan presented a keynote address at the one-day seminar on 'Gender Violence' organised by the Integrated Population and Development Project (Assisted by UNFPA) at Kannur. She presented a paper on 'Gender issues in Medical Research on Reproductive Health' at the consultation on Gender and Medical Education organised jointly by CEHAT, Mumbai and AMCHSS, SCTIMST, at Trivandrum.

Dr. Nagesh S. presented an invited talk on Heart Pump at MEE/PPFE, VSSC Thiruvananthapuram.

V. Mohanan Nair served as a trainer in health management for various training programmes for Medical Officers and Primary Health Care staff,

organised by the Kerala Health Services under the RCH programme in Thiruvananthapuram, Kollam, Alapuzha, Ernakulam and Thrissur districts. He was a trainer of trainers in health management in the State Institute of Health and Family Welfare, Thiruvananthapuram for various training programmes for District and State level officials under the RCH programme. He served as a faculty in the training programmes for Medical Officers organised by the Institute of Management in Government under the Government of Kerala, in the training programmes for District and State level officials from Tamil Nadu, Lakshadweep and Kerala organised by the Foundation for Health Management under the auspices of the National Institute of Health and Family Welfare, New Delhi, in the Workshop on Nursing Education and Research organised by the College of Nursing, Thiruvananthapuram, and in the workshop organized by the students wing of Indian Medical Association, Thiruvananthapuram. He attended a workshop on RCH programme organised in Hyderabad by the Indian Public Health Association under the auspices of the National Institute of Health and Family Welfare, New Delhi.

CV.Muraleedharan gave an invited talk on "Sitra-Chitra Vascular Graft Prosthesis" at the National Symposium on Medical Textiles at Chennai in July.

Dr. MD.Nair attended a workshop on 'Ethical issues in health research' organized by Kerala Health studies and Research center, Forum for Medical ethics society and Department of Community medicine, Medical College, Thiruvananthapuram.

Mrs. Naseema went for training on Leptospira culture work, to the Microbiology department of Christian Medical College, Vellore.

Dr. PK. Neema gave an invited lecture on Blood gas in Neuromedical ICU at Urology CME Programme held at Medical College, Thiruvananthapuram in October 2001.

Dr. K. Radhakrishnan delivered the prestigious Dr. KV.Mathai oration at the Guwahati Institute of Neurology, Guwahati, Assam, on 05.01.2002. He also lectured on 'Video-EEG monitoring', 'Medically Refractory Epilepsy' and 'Epilepsy Care in Developing Countries', during his visit to Guwahati. He moderated the Panel Discussion on Epilepsy in the Neurology Update 2001, organized by MCH, Kottayam. He also participated in the National Epilepsy Workshop, NIMHANS, Bangalore in October 2001. The workshop discussed on to how to evolve an epilepsy manual for primary and secondary care providers. He was an invited faculty to the Workshop and gave lectures on 'Seizure Semiology and Classification' and 'Long term Video-EEG Monitoring in a Developing Country Set-up'. He visited the department of Neurology, JIPMER, Pondicherry in September 2001 and delivered three lectures: 1) Neuroepidemiology, 2) Medically refractory epilepsy and 3) Epilepsy care in developing countries. He visited AIMS, Cochin, inaugurated the Epilepsy Self Help Group and gave a lecture on, 'Epilepsy Care in Developing Countries'.

D.Ranjit attended a Technology Managers Meet organized by TIFAC, DST, New Delhi to formalize the IPR & Technology Transfer policy of Indian Academia.

Dr. S. Rupa gave lectures on 'Organization of an Intensive Care Unit at the CME program of Department of Obstetrics & Gynecology of SAT hospital, Thiruvananthapuram in December, 2001.

Dr.PSankara Sharma, participated in the training programme on "Health, Rights and Women's

Empowerment" for MacArthur Fellows and Institutional Grantees, held at Indian Institute of Management, Bangalore.

KMS. Sankaran Kutty and PK. Govindan Nair of the Engineering services attended 5 days training course on 'CNC Part Programming' in Central Manufacturing Technology Institute at Bangalore.

Dr. Shama Rao spoke on "Imaging in Congenital Lesions of Brain" at the CME program of IRIA State Conference at Calicut.

Sujatha and Jaichand attended a 10 day workshop on "Recombinant DNA Technology" at Central Facility for Biotechnology Research, Madurai.

Dr. R.Sukanya attended a training workshop on 'Case control study designs' at Christian Medical College, Vellore. She participated in the seminar 'Working with People on Reproductive Health' organized by SEARCH, Gadchiroli district. She also participated in the '3rd Dorabji Tata Symposium on Diarrhoeal Diseases' organized by Sir Dorabji Tata Centre for Research in Tropical Diseases, Indian Institute for Science Bangalore.

Dr. PV.Sulochana attended a two day workshop on HLA typing and cross matching on organ transplant, stemcell harvesting and cord blood banking at Bangalore.

Dr.KR.Thankappan participated in a one-day brainstorming session on Gender and Medical Education at Mumbai. He presented a paper on "Measurement of Socioeconomic Status in Household Surveys for Non-communicable Diseases Risk Factors" in the "Workshop on Development of National NCDs Surveillance Network in India" held at New Delhi. He visited Dibrugarh Medical College, Assam as part of

Public Health Schools Without Walls network development project.

Dr. D.Varatharajan participated in the Board of Studies Meeting for Field Epidemiology Training Programme of Master of Applied Epidemiology Course at National Institute of Epidemiology (ICMR), Chennai. He participated as a resource person in the International Seminar on 'Decentralisation in Kerala: Status and Next Steps' organised by Institute of Management in Government, Thiruvananthapuram. He presented a paper on "Decentralisation Process in Kerala: Planning and Priority Setting at the Local Level" at the Workshop on 'Health and Rights Agenda Within the Context of Health Reforms' organised by Centre for Health and Gender Equity (USA) at Thiruvananthapuram. He presented a paper on 'National Health Policy 2001" at the Workshop on National, State and Tribal Health Policies organised

by Achutha Menon Centre for Health Science Studies and Department of Health and Family Welfare, Government of Kerala at Thiruvananthapuram. He presented a paper on "Good health at low cost in Kerala – Is it a myth?" at the Workshop on 'Health Policy for Kerala' organised by Indian Medical Association (Kerala State), Thiruvananthapuram. He participated as an expert in the Workshop on "Outcome Assessment on Economic Evaluation" organised by IndiaCLEN at CERTC, Medical College, Thiruvananthapuram, as a resource person in the "Workshop on Preparation of State Health Policy" organised by Institute of Management in Government, Thiruvananthapuram, in the Dissemination Workshop on "Tracking progress towards sustained elimination of IDD Kerala" organised by the Department of Community Medicine and Department of Health Services, Government of Kerala at Thiruvananthapuram.

Conferences / Meetings / Workshops & Seminars Attended by Students/Research Scholars

Dr. NV Ahsan Moosa attended the First National Workshop on 'Critical Care Neurology', held at Hyderabad in March 2002.

Dr. Amit Mishra attended the 15th Biennial Congress of the Association of Cardiovascular and Thoracic Surgeons of Asia December 2001 and presented a paper on 'Aortic arch aneurysm surgery in Sree Chitra Tirunal Institute- a ten year experience'. He also attended the 48th Annual conference of Indian Association of Cardiovascular and Thoracic surgeons at Chennai and presented "Intraoperative management of intractable ventricular arrhythmia- a case report" and "Bidirectional Glenn shunt for right ventricular endomyocardial fibrosis- a case report".

Dr. K.T. Anand attended the 48th Annual conference of Indian Association of Cardiovascular and Thoracic surgeons at Chennai and presented "Right ventricular mass: a histopathological surprise- a case report" and 'Continuous veno-venous haemofiltration/dialysis for acute renal failure after cardiac operations".

Dr. K. Anand Srinivasan presented "Patent Ductus Arteriosus Coil Occlusion: 2 Year Experience" & "Pacemaker Implantation in Children: 21 Years Experience" at the 54th National conference of Cardiological Society of India held at Hyderabad in December. Dr. BRJ. Kannan presented "Ventricular Septal Defect with Severe Pulmonary Hypertension: Long-Term Results of Surgery" & "Long-Term Follow-up of Unoperated Case with Ventricular Septal Defect with Severe Pulmonary Hypertension". Dr. Krishnakumar Nair presented "Persistent Truncus Arteriosus: Clinical, Hemodynamic Data and Follow-up : A Study of 36 Cases" and "Peripheral Pulmonary Artery Stenosis : Clinical and Angiographic Profile, and Follow-up". Dr. K. Krishnakumar presented "TGI Index as a Marker of Left Ventricular Systolic and Diastolic Function", Dr. MD. Syamkumar presented "Functional Outcome and Follow -up Assessment After Atrial Switch Procedures for d-TGA: Utility of Echocardiographic Indices of Right Ventricular Function" and Dr. Sonny P Jacob presented "Congenital Coronary Anomalies of Origin and Distribution in Adults: A Coronary Arteriographic Study".

Dr. M. Anbarasu presented "Bidirectional Glenn shunt- a rare indication in right ventricular endomyocardial fibrosis- a case report" Dr. Baiju S Dharan presented

“Bilateral unidirectional Glenn shunts- a rare indication’, Dr. Girish Warriar presented “One-and – a- half ventricle repair- a Chitra experience” and Dr Paresh P Shah presented ‘Right coronary sinus to left ventricle fistula with complete heart block- a case report” & “Repair of cleft on anterior tricuspid leaflet- a case report” at the 48th Annual conference of Indian Association of Cardiovascular and Thoracic surgeons at Chennai.

Dr.Anu Jacob attended the Neurocon 2001, conducted by the Neurological Society of India, and presented a paper ‘Emotional Facial Paresis (mimic facial palsy) in Temporal Lobe Epilepsy –Frequency and Value in Lateralization’.

Dr. R.Ashalatha presented the paper ‘Ganglioglioma as a Cause of Refractory Epilepsy’ at the Second Joint Conference of IEA and IES at Mumbai.

Dr. Easwer presented a paper on “ Pituitary adenoma: A red herring” and Dr. Muthu Retnam s presented a paper on “ Esthesioneuroblastoma – A rare tumour” at the 3rd annual conference of Skull Base Society of India at Chennai.

Elizabeth K. Abraham attended the Indian Rubber Conference, RubCon-2002 at I.I.T., Kharagpur 2002 and presented a research paper.

RS.Jayasree attended the 14th World Congress of the International Society of Laser Surgery and Medicine at Chennai and presented the following papers: (i) The effect of 5-ALA and Laser on the wound healing process in rats , (ii) Regression of solid tumor using laser and 5-Aminolevulinic Acid in mice, (iii) Effect of lasers and photosensitisers on the chemically transformed tissue of mice, (iv) In vitro evaluation of the depth of thermal damage on tissues using Nd: YAG laser and (v) Spectroscopic analysis of a

submandibular sialolith resected from the Wharton’s duct.

Dr. Krishnamoorthy presented a paper titled “Imaging in CV Junction Anomalies” at the Annual Conference of IRIA, Kerala Chapter in March 2002 at Cochin.

L. Manju attended the annual conference of the International Society Of Heart Research Indian Section and presented a paper titled “Marginal magnesium deficiency augments the negative inotropic response to cerium in rat ventricular papillary muscle”.

Dr.Narendra.K.Bodhey presented “Percutaneous Laser Disc Decompression-Long term follow up results at the 4th Annual Conference of ISVIR & ISNR, in December at Mumbai. Dr.P.Sukalyan presented “Percutaneous Vertebroplasty -Initial Experience”, “Carotid Artery Stenting- SCTIMST Experience” & “Osteiod Osteoma-CT guided percutaneous laser ablation in spine and long bones”, Dr.Ravi Varma Dandu presented “Vein of Galen Malformation” & “Magnetic Resonance Imaging in Temporal Lobe Epilepsy” & “Craniofacial Vascular Malformations: preoperative embolization”, Dr. Shama Rao presented “Dural Sinus Thrombolysis”, Dr.Krishnamoorthy presented “Endovascular Treatment of Carotico Cavernous Fistula” and Dr. Sheik Akbar Hussain presented “Direct Puncture embolization of Head & Neck tumour”.

Dr. NC.Prakash presented paper on “Paragangliomas of the skull base and neck” at the Annual conference of Neurological society of India held in Mumbai.

Dr. BJ.Rajesh presented a paper on “Cliniopathological study of cerebral aneurysms” at the Annual conference of Neurological society of India held in Mumbai.

Dr. Rajesh Kumar presented paper on “Stereotactic craniotomy” and Dr Somesh Chandra Desai presented a paper on “Pitfalls of Stereotactic biopsy” at the “5th Indian society of Stereotactic and functional Neurosurgery” at Ahmedabad.

Dr. Rakesh Goyal presented paper on “Chitra fibrin glue: A biological sealant for CSF leak” at the Annual conference of Neurological society of India held in Mumbai.

Dr. Sanjeev Kumar presented a paper on “Surgical outcome of multiple intracranial aneurysms” at the Annual conference of Neurological society of India held at Mumbai.

Ms. Shiny Velayudhan visited Institute for Composite Materials, University of Kaiserslautern, Germany, from October 7th to December 29th, 2001 as part of the on-going Indo-German (DST-DAAD) joint-research

programme. She presented a paper titled ‘Polymers in Medical Applications – State of Art’ at I.I.T. Kharagpur during Golden Jubilee Essay Competition held in September 2001.

TR.Santhoshkumar presented “Tissue engineering onto vascular grafts using saphenous vein endothelial cells to improve blood compatibility at the fourteenth Kerala Science Congress at Cochin.

Dr. K.Sudish presented paper on “Neuroendoscopy – preliminary perspectives” at the Annual conference of Neurological society of India held in Mumbai.

Three Neuro nursing students attended 22nd annual conference of the Society of Indian Neuroscience Nurses held at Mumbai, 15th to 18th December 2001. They presented three papers, posters and models and participated in Neuro quiz. The students bagged six out of 12 prizes.

STANDING COMMITTEES

Academic Committee

1. Prof. K.Mohandas, (Chairman)
2. Head, Biomedical Technology Wing,
3. Prof. A.K.Gupta, Professor of Radiology, Sree Chitra Tirunal Institute for Medical Sciences & Technology
4. Dr.G.S.Bhuvaneswar, Scientist–F, Sree Chitra Tirunal Institute for Medical Sciences & Technology
5. Dr. B.Ekbal, Vice Chancellor, University of Kerala, Thiruvananthapuram.
6. Dr. K. Srinath Reddy, Professor of Cardiology, AIIMS, New Delhi-29
7. Dr. S.K.Mahajan, Head, Molecular Biology & Agri. Division, BARC, Trombay, Mumbai-400 085.
8. Prof. S. Ranganathan, Emeritus Professor, Regional Research Laboratory, Thiruvananthapuram.
9. Prof. K.Radhakrishnan, Head, Department of Neurology, Sree Chitra Tirunal Institute for Medical Sciences & Technology

Building Committee

1. Prof. K.Mohandas, Director of SCTIMST, (Chairman)
2. Head, Biomedical Technology Wing, Sree Chitra Tirunal Institute for Medical Sciences & Technology.
3. Secretary to the Government of Kerala, Health & Family Welfare, Sports and Youth Affairs, Thiruvananthapuram.

4. The Civil/Construction Engineer, ISRO, Vikram Sarabhai Space Centre, Thiruvananthapuram.
5. Sri. PVijaykrishnan, Financial Advisor & Chief Accounts Officer, Sree Chitra Tirunal Institute for Medical Sciences & Technology (Convenor).
6. A member to be co-opted by the Director as and when necessary.

Finance Committee

1. Prof. K.Mohandas, Director (Chairman)
2. Prof. V. S. Ramamurthy, Secretary to the Government of India, Ministry of Science and Technology, Technology Bhavan, New Delhi - 110 016.
3. Sri. Arun Sharma, Joint Secretary to Government of India and Financial Advisor, Department of Science & Technology.
4. Dr. M.R.Das, Chairman, State Committee on Environment, Science and Technology, Government of Kerala, Thiruvananthapuram.
5. Sri. PVijaykrishnan, Financial Advisor & Chief Accounts Officer (Ex-Officio Convenor).

Senior Staff Selection Committee

1. Prof. K. Mohandas, (Chairman), Director, SCTIMST
2. Dr.V.R.Muthukkaruppan, Former Vice Chancellor, Bharatidasan University, Vadapalani, Chennai-600 026.
3. Head, Biomedical Technology Wing, SCTIMST.
4. A nominee of the Secretary, Department of Science & Technology, Government of India, New Delhi.

5. A Senior Professor of SCTIMST.
6. A nominee of the President (External Expert).

Junior Staff Selection Committee

1. Dr. P.Velayudhan Pillai, (Ex-officio), Medical Superintendent, Sree Chitra Tirunal Institute, Thiruvananthapuram.
2. Head, Biomedical Technology Wing,
3. Sri. P.B.Sourabhan, Dy. Director (Admn), Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram.
4. Mrs. Vijayamma Harikrishnan, Nursing Superintendent, Sree Chitra Tirunal Insitute for Medical Sciences & Technology, Thiruvananthapuram.
5. Representative of Academic Staff of the Institute nominated by the Director.

Ethics Committee

1. Mr. Justice S. Sankarasubban (Chairman), Judge, High Court of Kerala, Kochi.
2. Dr. G.Santhakumari, Former Prof. of Pharmacology & Director of Medical Education, Government of Kerala, R.G.286, Thriveni, Ulloor, Trivandrum-695011.
3. Dr. K.A Kumar, Professor of Psychiatry, Medical College, Thiruvananthapuram.
4. Head BMT Wing
5. An external expert on the device technology (to be identified and nominated by the Director each time)
6. Director of the Institute.

Technology Development Committee

1. Prof. K.Mohandas, Director (Chairman)

2. Dr.N.Appaji Rao, Department of Biochemistry, Indian Institute of Science, Bangalore-560 012
3. Dr. Aurthur Vijayan Lal, Scientist-F, Sree Chitra Tirunal Institute, Thiruvananthapuram.
4. Dr. A.P Chaukar, Prof. & Head of CVTS, Dept. of CVTS, LTM Medical College, Sion, Mumbai-400 022.
5. Dr. M.R.Das, Chairman State Commitee of Environment, Science & Technology, Government of Kerala, Thiruvananthapuram.
6. Dr. Mira Mohanty, Scientist-F, Sree Chitra Tirunal Institute, Thiruvananthapuram
7. Dr. Placid Rodriguez, Director, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam 603 102, Tamil nadu.
8. Dr. S.Ramachandran (Ex. Secretary, DBT, DST, Govt. of India), 1, Playground View Street, Nandanam Extension, Chennai - 400 036.
9. Head, Biomedical Technology Wing,

Technology Transfer Committee

1. Dr.S.Varadarajan (Chairman), President, Indian National Science Academy, New Delhi 110 002
2. Sri. S. Sivaram, Dy. Director, National Chemical Laboratory, Pune 411 008.
3. Sri. S.B.Krishnan, Secretary, Technology Development Board, Dept.of Science & Technology, New Delhi, 10 016.
4. Sri. 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

Professor K.Mohandas, MD

Director

Academic Division

Professor CC. Kartha, MD, FNASc, FASc

Dean

Dr.AV. George, MA, BEd, PhD

Registrar

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

PP. Saramma, BSc, MN

Instructor in Nursing

Public Relations

TV. 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, M D, M PH

Additional Professor

Dr.PSankara Sarma, PhD

Associate Professor

Dr.Amar Jesani MBBS

Program Coordinator (Adhoc)

Dr.Mala Ramanathan, PhD, MA

Associate Professor

Dr.D.Varatharajan, PhD

Associate Professor

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

PB.Sourabhan, MA, LLB, PGDMM, DCA

Deputy Director (Administration)

P.Vijayakrishnan, BSc, CA

Financial Advisor & Chief Accounts Officer

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

Administrative Officer Gr I

R. Ramachandran, SAS

Internal Audit Officer (On deputation)

IT.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

R.Sreekumar, BSc, PGDMM

Purchase Officer Gr I

Sudhakara Sharma, BA

Stores & Purchase Officer Gr II

George Philip, BA (*upto 31/5/2001*)

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)

Construction Engineer

G. Gopinatha Kurup

Junior Engineer (Civil)

Biomedical Technology Wing

Dr.G.S.Bhuvaneshwar, MS, PhD

Head

Artificial Organs

Dr.GS.Bhuvaneshwar, MS, PhD

Leader

CV.Muraleedharan, MTech

Engineer F

Bioceramics & SEM Laboratory

Dr. PR.Harikrishna Varma, PhD

Scientist D & Leader

Dr Manoj Kamath, PhD

Scientist C

S.Vijayan, MSc

Jr. Scientific Officer

R.Sreekumar, BSc.

Jr. Scientific Officer

Biosurface Technology

Dr.Chandra PSharma, MTech, MS., DSc., MEBE.

Scientist F & Leader

Calibration Cell

CV.Muraleedharan, MTech

Engineer F

Leena Josphe BTech.

Engineer

Customer Service Cell

S.Balaram, MTech

Scientist D & Leader

John T Eapen, PhD

Scientist D

Dental Products

Dr.V. Kalliyana Krishnan, PhD

Scientist F (in-Charge)

Dr.P PLizymol, PhD

Scientific Assistant

Device Testing Laboratory

Dr. Nagesh, MTech

Engineer F & incharge

Modelling & Prototyping Laboratory

V.Vinodkumar, BTech.

Engineer B

Kalyani Nair, BTech.

Engineer B

CV Muraleedharan, Dip.Mech.Engg.

Scientific Assistant

Engineering Services

OS.Neelakantan Nair, BSc., (Engg.)

Engineer F & Leader

V.Ramesh Babu, BE. (Mech.)

Engineer D

KPR. Bhas, Dip. Electl. Engg

Assistant. Engineer

EB. Mohan Raj. Dip in Mech. Engg.

Foreman

Implant Biology

Dr.Mira Mohanty, MD (Pathology)

Scientist F and Leader in charge-of Histopathology

Dr.TV. Kumary, PhD (Biochemistry)

Scientist F (in charge of Tissue Culture laboratory)

Dr.Annie John, PhD (Zoology)

Scientist C in charge of TEM

Dr.TV.Anilkumar, MVSc, PhD

Scientist C, Histopathology laboratory.

Instrumentation

Niranjana Khambete, MTech, PhD
Engineer D

Microbiology

Dr. Maya A.Nandakumar, PhD
Scientist D in charge (on leave)
 Dr. Arthur Vijayan Lal, BVSc
Scientist F (acting in charge)

Molecular Medicine

Dr.T.Anoopkumar, PhD
Scientist D and Leader

Polymer Analysis

Dr. K. Sreenivasan, PhD
Scientist F
 Dr.Prabha D.Nair, PhD
Scientist F (on leave)
 PR.Hari, BSc, AIE
Scientific Assistant
 C.Radhakumari, MSc
Scientific Assistant

Polymer Chemistry

Dr.A.Jayakrishnan, PhD
Scientist F and Leader

Polymer Division

Dr.M.Jayabalan, PhD
Scientist F and Leader

Polymer Processing Laboratory

Dr.P Ramesh MTech, PhD.
Scientist D & Leader.
 Roy Joseph, MSc, MTech, PhD
Scientist D (on leave)
 MC. Sunny, BSc., AIC
Scientific Assistant

Quality Cell

DS.Nagesh, MTech
Engineer F and Quality Manager
 S.Balram, MTech
Scientist D

Technical Co-ordination Cell

D. Ranjit, BE. (Electrical)
Engineer F

Technology Proving Facility

Dr.GS.Bhuvaneshwar, MS,PhD
Biomedical Engineer.
In Charge
 DS.Nagesh, MTech
Engineer F

Technology Transfer Cell

D.Ranjit. BE.(Electrical)
Engineer F

Thrombosis Research Unit

Dr.Lissy K. Krishnan, MSc, PhD
Scientist F & Leader
 K R Resmi, MSc (upto 16/9/02), PhD
Scientist B (Temporary)

Toxicology Division

Dr.A.C.Fernandez, MSc, PhD
Scientist & Leader
 Dr.PV.Mohanan, MSc, PhD
Scientist C (on study leave)
 Jacob Varghese Biboy, MSc
Scientist (Temporary) upto 1/9/2002

Vivarium

Dr.Arthur Vijayan Lal, BVSc
Scientist F (Vet) and Leader
 Dr.PR.Umashankar, MVSc
Scientist C (Vet)

Hospital Wing

Dr.PVelayudhan Pillai MS, MCh

Medical Superintendent

Dr.S.K.Jawahar, MBBS (On leave)

Asst. Administrative Medical Officer

Smt.Vijayamma Hari Krishnan RN, RM, BSc (N)

Nursing Superintendent

Smt.Sudhamaniamma MSc (N), PGDHRM

Smt. Rosamma Edward (*upto 31/5/01*)

Deputy Nursing Superintendent

Anaesthesiology

Dr.K. Mohandas, MD

Professor & Director of the Institute

Dr.RC.Rathod, MD

Professor & Head

Dr.(Mrs) Rupa Srinivas, MD, Dip.NBE

Additional Professor

Dr.Thomas Koshy, MD

Associate Professor

Dr.Srinivas V.Gandhinhaljkar, MD

Associate Professor

Dr. Prasanth Kumar Dash, MD

Associate Professor

Dr.Raghunath Sreedhar Nalgirkar, MD

Associate Professor

Dr.PK. Neema, MD

Associate Professor

Dr.S.Manikandan, MD

Assistant Professor from 19.4.2001

Dr.Prabhat Kumar Sinha, MBBS, MD

Assistant Professor from 1.9.2001

Dr.P. Gayathri, MBBS, MD, PDCC

Assistant Professor from 1.12.2001

Dr. K.PUnnikrishnan, MBBS, MD

Adhoc consultant, Anaesthesiology

Ganapathy Potti.E

Scientific Assistant

Biochemistry

Dr.K.Subramonia Iyer PhD

Professor and Head

Dr.PS.Appukuttan PhD

Additional Professor

Dr.N.Jayakumari PhD

Additional Professor

Shanta A George MSc

Scientist E

K.I.Annamma.BSc

Junior Scientific Officer

Sri.B.Sasikumar.M.Sc

Junior Scientific Officer (Lab) -A

Biomedical Engineering

K.Vijayakumar, BSc, BSc (Engg.)

Engineer F and Head

Koruthu P Varughese, BSc (Engg.), PGDEDT, PGDCA.

Engineer E.

G.Mohanlal, BSc (Engg.)

Engineer E

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. PV 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. VAjithkumar, MD, DM
Additional professor

Dr. Anil Bhat, MD, DM
Additional professor (on leave)

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

Dr. Bimal Francis, MD, DM
Associate professor (on leave from 1/11/2001)

Dr. KM. Krishnamoorthy, MD, DM
Assistant Professor

Dr. S. Harikrishnan, MD, DM
Assistant Professor

Dr. R. Padmakumar, MD, DM (from 18/4/01)
Dr. Rakesh Gopal, MD, DM

Adhoc Consultant, Cardiology

Dr. Santhoshkumar Dora, MD, DM
Post DM Fellow in Cardiology

R.N. Vijayasanen
Junior Scientific Officer (Cathlab-B)

Cardiovascular & Thoracic surgery

Dr. K.S. Neelakandan, MS, MCh, FAMS
Professor & Head

Dr. K. Jayakumar, MS, MCh
Professor Adhoc

Dr. R. Shankar Kumar, MS, MCh.
Additional 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 From (18/4/2001)

Dr. PK. Praveen Varma, MCh
Assistant Professor From (7/6/2001)

Thomas Maliakal
Scientific Assistant

Cellular and Molecular Cardiology

Dr. CC. 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 E

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
Assistant 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 V.Thomas, 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 (Neurology)

Assistant Professor (on leave upto 2/11/2001)

Dr. Joseph Cheriyan P, MD, DM,DNB,DABN(CI/N Ph)

Assistant Professor

Dr. P.S. Mathuranath, DM

Assistant Professor

Dr.PN.Sylaja, MD, DM

Adhoc consultant

Dr. N. Ahsan Moosa, MD,DM

Adhoc consultant

Neurosurgery

Dr. RN. Bhattacharya, MS, MCh

Professor & Head

Dr. S. Suresh Nair, MCh

Professor

Dr. Dilip Panikar, MS, MCh

Associate Professor

Dr. Malla Bhaskara Rao, Dip NB

Additional Professor

Dr. Rajneesh Kachhara, MS, MCh

Associate Professor

Dr. Ravi Mohan Rao, MS, MCh,DipNB

Assistant Professor

Dr. R. Girish Menon, MCh, DipNB

Assistant Professor (upto 16/4/02)

Dr. S. Parameswaran, MCh

Adhoc consultant

Pathology

Dr. V V Radhakrishnan, MD

Professor & Head

Dr. S. Sandhyamani, MD,FAMS

Additional Professor

Dr. Annamma Mathai, PhD

Junior scientific Officer



Statement of Accounts 2001-2002

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Balance Sheet As at 31st March 2002.

Figures for the Previous year		GENERAL FUND AND LIABILITIES	Amount	
Rs.	Ps.		Rs.	Ps.
GENERAL FUND:				
1105104524.25		Balance as per last Balance Sheet	1229361369.25	
		Additions out of		
12000000.00		(a) Grant from Govt of India for Plan Expenditure	12100000.00	
4256845.00		(b) Donations for Specific purposes utilised during the year	2509937.00	
1229361369.25			1352871306.25	
1040849.96		Less: Capital Assets written off	1040849.96	
		Less: Excess of Expenditure over Income adjusted out of General Fund upto 31-03-2001	424516119.27	
352839916.82			75674429.77	
71676202.45		Less: Excess of Expenditure over Income for the current year	464302666.93	
412442096.11		Less: Reserve for depreciation till 31-03-2002		
391362303.91			387337240.32	
69692491.00		Sinking Fund	82049157.00	
16067614.80		Technology Development Fund	17658248.80	
25403312.39		Unutilised Grants for Research Projects	26122738.30	
188939637.29		Employee's Benefit Funds	215577981.59	
Current Liabilities & Provisions				
7723948.32		Sundry Creditors for expenses	13656000.73	
17576550.49		Other Liabilities	18361821.83	
17534983.41		Temporary OD from Banks	5699609.76	
734300841.61		TOTAL	766462798.33	

Sd/-
Financial Adviser &
Chief Accounts Officer

Figures for the Previous year		ASSETS	Amount			
Rs.	Ps.		Rs.	Ps.	Rs.	Ps.
795373439.35		FIXED ASSETS	832390284.60			
1040849.96		Less: Assets written off	1040849.96			
412442096.11		Less: Depreciation provided till 31-03-2002	464302666.93			
381890493.28						367046767.71
		Current Assets				
16201125.79		General Stores	13586347.39			
2270012.24		Tools	2350406.20			
7138989.91		Instrument	6409620.97			
1113363.44		Glasswares	1128289.15			
7223103.57		Spares	6120780.94			
5171533.23		Medicine	6571316.99			
2000.00		Investment in shares of Employees co-operative society	2000.00			
						36168761.64
		Deposits				
1657995.28		Deposit with Banks				1795005.28
190316579.75		For Staff Benefits				216116009.05
94155351.88		For Specific purposes				114511396.88
		Loans & Advances				
		Advances recoverable in cash or in kind or for value to be recovered				
		Unsecured considered Good				
2383669.00		For Purchases	3919159.00			
13881756.82		To Staff	13104334.07			
5986499.75		Other Advances	6931411.65			
0.00		Grant received from Govt. of India	0.00			
1139901.01		Amount receivable from sponsors of Projects	3536892.32			
						27491797.04
		Cash & Bank Balances				
497154.15		Cash and stamps in hand	511268.44			
3271312.51		Balance with Banks	2821792.29			
						3333060.73
734300841.61		TOTAL				766462798.33

Sd/
Director

Income and Expenditure Statement Account for the year ended 31st March 2002

Figures for the Previous year		EXPENDITURE	Amount	
Rs.	Ps.		Rs.	Ps.
		Excess of Expenditure over Income		
140848279.21		Hospital wing	143676613.52	
23043010.51		Bio Medical Technology Wing	27142075.92	
443456.75		Expenses for Committee Meetings	284622.50	
87400.00		Legal Expenses	135350.00	
55186.00		Travelling Expenses	168387.00	
11761708.65		Expenses for Academic Programmes	12123204.80	
687830.00		Travelling Expenses for Seminars and Conferences	788481.00	
458189.00		Expenses of Achutha Menon Centre	2118401.00	
177385060.12		Total	186437135.74	

Sd/-
Financial Adviser &
Chief Accounts Officer

Figures for the Previous year		INCOME	Amount	
Rs.	Ps.		Rs.	Ps.
100000000.00		Grant Received from Govt. of India	105000000.00	
329511.00		Rent	420784.00	
709668.00		General Receipts	613353.00	
279985.00		Notice Pay received	152023.00	
1080220.00		Interest received-Staff	937017.45	
1561674.67		Interest received-Bank	1150890.82	
158450.00		Leave salary collected	0.00	
		Income from Awards	500000.00	
54300.00		Income from Sale of Assets	0.00	
1064491.00		Receipts from Academic activities	854256.20	
470558.00		Income from Projects-AMC	1134381.50	
71676202.45		Excess of expenditure over Income transferred to General Fund Account	75674429.77	
177385060.12		Total	186437135.74	

Sd/
Director

Income and Expenditure Account for the year ended 31st March 2002 - Hospital Wing

Figures for the Previous year		EXPENDITURE	Amount	
Rs.	Ps.		Rs.	Ps.
22533969.95		Medicines	26214069.24	
90823.00		Chemicals	32773.00	
3528582.00		Medical Gases	3964783.00	
4485532.00		Films & Chemicals for Radiology dept.	620872.00	
558689.15		Uniforms & Hospital linen	840876.00	
65991320.51		Hospital items	82588858.58	
942164.90		Hospital expenses	1049601.60	
2517080.70		Inpatient Diet Expenses	2686795.95	
4622902.30		Laboratory Expenses	6498423.00	
117878269.50		Salaries & Allowances	121629246.50	
293096.00		Honorarium to Visiting faculty	323409.00	
4707260.00		Medical benefit to Staff	3988950.00	
4104.00		Contribution to Provident Fund	0.00	
141932.00		Travelling Expenses	87760.00	
23193.00		Expenses for visiting Faculty	33424.00	
1265128.00		Home travel & Leave travel concession	4220.00	
1096873.00		Postage Telephone and Telegrams	1170862.00	
1820413.50		Printing & Stationery	1524530.00	
371465.00		Advertisements	732110.00	
30523.50		Recruitment expenses	36010.75	
14455302.00		Electricity & Water charges	16948854.00	
306009.00		Freight, Insurance & Handing charges	599538.00	
482461.35		Vehicle maintenance expenses	434178.50	
189331.00		Bank charges and commission	137876.00	
0.00		Agricultural expenses	1900.00	
265080.00		Taxes & Licences	256780.00	
		Repairs & Maintenance		
16798079.68		Equipments	18308973.76	
2454264.65		Buildings	961476.45	
1132784.85		Others	4538712.30	
1350.00		Staff training expenses	25976.00	
3315.00		Research-In house projects	2816.00	
163313.00		Other expenses	202319.25	
1370383.67		Tools, Glasswares & Instruments-consumed	1216123.04	
7955628.00		Contribution to Pension Fund	9564838.00	
7203153.00		Contribution to Sinking Fund	15681246.00	
400000.00		Contribution to Gratuity Fund	400000.00	
285083777.21		Total	323309181.92	

Sd/-
Financial Adviser &
Chief Accounts Officer

Figures for the Previous year		INCOME	Amount	
Rs.	Ps.		Rs.	Ps.
		Hospital Collections		
111974797.00		Inpatient Charges	140659685.00	
32091263.00		Investigation & Registration charges	31480637.80	
110100.00		Income from Projects	285761.60	
59338.00		Receipts from medicine	132254.00	
		Income from Sinking Fund investments	7074230.00	
		Excess of expenditure over Income transferred to		
140848279.21		Income & Expenditure Account-General	143676613.52	
		Total	323309181.92	

Sd/-
Director

Income and Expenditure Account for the year ended 31st March 2002 -Biomedical Technology Wing

Figures for the Previous year		EXPENDITURE	Amount	
Rs.	Ps.		Rs.	Ps.
735724.00		Chemicals	766715.90	
81199.30		Consumable stores	161166.00	
223444.05		Laboratory expenses	410144.25	
17256374.70		Salaries & Allowances	19083404.00	
215770.00		Medical benefits to staff	272146.00	
67468.00		Travelling Expenses	131453.00	
41410.80		Uniforms to staff	21771.75	
0.00		Expenses for Visiting faculty	13412.00	
250558.75		Postage, Telephone & Telegrams	333995.00	
123359.80		Printing & Stationery	212664.50	
19650.00		Advertisements	0.00	
1778623.00		Electricity & Water charges	2597370.00	
50879.50		Freight, Insurance & Handling Charges	85611.00	
3987.00		Bank charges & commission	17006.00	
64486.50		Garden & Estate expenses	96589.30	
		Repairs & Maintenance Expenses		
984209.00		Equipments	1466106.00	
133588.00		Buildings	137587.00	
31583.00		Others	122378.00	
551911.85		Animal Research Lab expenses	478089.90	
104426.50		Other expenses	149040.50	
407841.70		Work shop & Tool room expenses	609101.24	
19226.00		Honararium	24597.00	
188436.00		Seminar & Conference expenses	31976.00	
67815.00		Legal charges	7274.50	
0.00		Exhibition expenses	23359.00	
291727.00		Home travel & Leave travel expenses	0.00	
0.00		Vehicle maintenance expenses	0.00	
80702.00		Taxes & Licences	80372.00	
1260207.71		Tools, Glassware and Instruments written off	1255956.03	
2000.00		Staff Training Expenses	75277.00	
3619642.80		Contribution to Tech-Devel-Fund-(Royalty)	1659504.00	
0.00		Research expenses-In house projects	0.00	
0.00		Visiting faculty expenses	0.00	
840.00		Committee meeting expenses	68624.00	
28657091.96		TOTAL	30392690.87	

Sd/-
Financial Adviser &
Chief Accounts Officer

Figures for the Previous year		INCOME	Amount	
Rs.	Ps.		Rs.	Ps.
3619642.80		Premium & Royalty Received	94730.00	
248010.00		Facility charges received	390316.00	
32103.00		Overhead charges collected from Projects	793514.90	
13260.00		Interest Received	18336.00	
124620.20		Income from Garden & Estates	6666.20	
47767.45		Sundry receipts	95832.75	
1352116.00		Interest on Technology Fund	1626207.00	
170562.00		Rent collected from staff	200875.00	
0.00		Sale of Tender forms	330.00	
6000.00		Examination fee received	12000.00	
		Notice pay received from Staff	11807.10	
23043010.51		Excess of expenditure over Income transferred to General Income and Expenditure Account	27142075.92	
28657091.96		TOTAL	30392690.87	

Sd/-
Director

Receipts and Payments Accounts for the year ended 31st March 2002

Figures for the Previous year		RECEIPTS	Amount	
Rs.	Ps.		Rs.	Ps.
		Opening Balance		
363697.75		Cash in Hand	497154.15	
193307.87		Balance with banks for G.P	3271312.51	
		Hospital Collection		
115336390.00		Inpatient deposit	139197542.00	
29185423.00		Investigation and Registration Charges	29568245.80	
		Research and Development Wing		
3619642.80		Royalty received	94730.00	
124620.20		Income from estate	6666.20	
29374.00		Sundry receipts	82401.10	
10593.00		Interest on bank deposits	18336.00	
1352116.00		Interest on specific deposits	1626207.00	
232250.00		Facility hire charges	351816.00	
		General Receipts		
634202.00		Sundry receipts	367148.70	
161829.00		Rent	197988.00	
2067136.67		Interest received	1557725.82	
1363545.00		Application & Examination fee from PG Students	493808.00	
221798.00		Notice Pay received	117733.00	
67108.00		Leave salary contribution	0.00	
0.00		Receipts for Achutha Menon Centre	288000.00	
		Grant received from Govt. of India		
100000000.00		For recurring expenses	105000000.00	
120000000.00		For Capital expenses	121000000.00	
31092198.60		Grant for specific research Projects	36942301.00	
11218317.73		Receipts for specific purpose	199992413.00	
951220.40		Deposit received	1096072.00	
54300.00		Receipts from sale of Assets	0.00	
33193457.00		Receipt for PF & Pension fund	38319566.85	
0.00		Fund Received for Awards	500000.00	
17534983.41		Temporary over draft (Bank)	0.00	
10000000.00		Deposit refunded	0.00	
479007510.43		Total	500587167.13	

Sd/-
Financial Adviser &
Chief Accounts Officer

Figures for the Previous year		INCOME	Amount	
Rs.	Ps.		Rs.	Ps.
		Expenses for Hospital Wing		
132407857.45		To Staff	145555820.80	
159797910.40		To Others	164107202.51	
		Expenses for Hospital Wing		
18355325.40		To Staff	21186687.35	
4597768.88		To others	9079482.54	
645493.50		Expenses for general purposes	0.00	
10614857.40		Expenses for Academic purposes	11655047.80	
118128.00		Expenses for Achutha Menon Centre	76792.00	
67584188.90		Payment for fixed assets	36083740.00	
0.00		Payment for tools	109530.00	
1312011.00		Payment for glasswares	246152.00	
371787.00		Payment for Instruments	748594.20	
0.00		Refund of Bank overdraft	12718489.65	
24260269.31		Payment for Projects	23857825.70	
701627.00		Deposits Refunded	1144403.50	
47897777.53		Deposit for specific expenses	55264892.35	
6555758.00		Deposit for Sinking Fund	5282436.00	
18284.00		Deposit-Others	10137010.00	
		Closing Balance		
497154.15		Cash in Hand	511268.44	
3271312.51		Cash with Banks	2821792.29	
479007510.43		Total	500587167.13	

Sd/
Director

Schedule of Fixed Assets as on 31-03-2002

GROSS BLOCK

Particulars of Assets	As on 1-4-2001		Additions during the year		Assets disposed of		Total	
	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	ps.
1. Land	1463299.63			0.00			1463299.63	
2. Land Development	122543.88			0.00			122543.88	
3. Buildings	88774060.18		783181.00				89557241.18	
4. Satelmond Palace Property	2166170.00			0.00			2166170.00	
5. Compound walls	3460656.68			0.00			3460656.68	
6. Equipments	520390333.59		29303453.25		559710.00		549134076.84	
7. Gas Plant Instillation	1053688.09		32550.00				1086238.09	
8. Air Conditioner & Refregirators	16898959.91		410224.00		25000.00		17284183.91	
9. Cold Room Installation	341700.00			0.00			341700.00	
10. Sub Station	1349552.25			0.00			1349552.25	
11. Electrical Installation	11665027.42		75601.00				11740628.42	
12. Water Cooler	62866.50			0.00			62866.50	
13. Lift Installation	3301433.10			0.00			3301433.10	
14. Canteen Equipments	99791.59			0.00			99791.59	
15. Office Equipments	857064.54		10857.00				867921.54	
16. Furniture & Fixtures	18421827.61		1835110.00		54107.00		20202830.61	
17. Motor Vehicles	2715789.30			0.00	398614.89		2317174.41	
18. Telephone Installation	1769870.94		83660.00				1853530.94	
19. Library Books	60853279.64		4314089.00		3338.07		65164030.57	
20. Kitchen Utensils	559520.22			0.00			559520.22	
21. Mural Paintings	361757.63			0.00			361757.63	
22. Cycles	6135.33			0.00	80.00		6055.33	
23. Roads	750822.04			0.00			750822.04	
24. Animal Houses & cages	433376.70		168120.00				601496.70	
25. Oxygen Cylinders	203362.42			0.00			203362.42	
26. Livestock	31848.00			0.00			31848.00	
27. Bore well	174615.00			0.00			174615.00	
28. Building-ACM	57084087.16						57084087.16	
Total	795373439.35		37016845.25		1040849.96		831349434.64	

DEPRECIATION BLOCK

Depreciation till 31-03-01		Depreciation for the year		Depreciation till 31-03-2002		Net Block	
Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
	0.00		0.00		0.00		1463299.63
	0.00		0.00		0.00		122543.88
	40150008.97		2470361.61		42620370.58		46936870.60
	719707.34		72323.13		792030.47		1374139.53
	991078.01		123478.93		1114556.94		2346099.74
	291801289.91		38599918.04		330401207.95		218732868.89
	626160.81		69011.59		695172.40		391065.69
	9095185.89		1228349.70		10323535.59		6960648.32
	330038.14		1749.28		331787.42		9912.58
	1194815.48		23210.52		1218026.00		131526.25
	7106832.21		695069.43		7801901.64		3938726.78
	61776.63		163.48		61940.11		926.39
	2237340.39		159613.91		2396954.30		904478.80
	70378.40		4411.98		74790.38		25001.21
	667554.35		30055.08		697609.43		170312.11
	11907320.00		1244326.59		13151646.59		7051184.02
	1964458.13		70543.26		2035001.39		282173.02
	1276823.83		86506.07		1363329.90		490201.04
	37503130.65		4149134.98		41652265.63		23511764.93
	395983.49		24530.51		420514.00		139006.22
	204022.62		23660.25		227682.87		134074.76
	5527.36		105.59		5632.95		422.38
	639687.49		16670.18		656357.67		94464.37
	348033.52		38019.48		386053.00		215443.70
	179462.91		3584.93		183047.84		20314.58
	14137.81		2656.53		16794.34		15053.66
	97137.40		11621.64		108759.04		65855.96
	2854204.36		2711494.14		5565698.50		51518388.66
	412442096.10		51860570.84		464302666.94		367046767.70

Accounting Policy of Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram

System of Accounting followed by Institute:

1. Income and Expenses of Institute are accounted on accrual basis
2. Depreciation on assets are calculated on reducing method at the rates recommended by Income tax Department.
3. Plan Funds received from Govt. of India and donations received specifically for acquiring Fixed Assets are added to General Fund of Institute and expenses incurred for Research and Academic purposes are reduced from it.
4. Five percent of receipts from patients are transferred to a Fund for meeting unexpected expenses on equipments.
5. Funds received from Technologies developed by Institute are transferred to a Fund (Technology Development Fund) for meeting additional expenses on improvement of Technologies already developed.

Notes on Accounts:

1. As per requirement of Audit, depreciation on Fixed Assets is provided and shown in Balance sheet, calculated on reducing balance method, at the rates fixed by Income tax Act (from the date of Installation of equipments).
2. Payment for Fixed assets in Receipts & Payments do not include any advance payments for fixed assets.
3. Since there is no surplus income for the Institute, Income tax is not payable by Institute.
4. Physical verification of Assets and other stock items are done for 2001-2002 during April to June 2002. Physical verification certificates will be shown to audit at the time of next audit.
5. Demand has been raised by Government of Kerala for payment of Rs. 15.86 crores as lease rent for the 20.725 acres of land at Poojapura (BMT wing) from 1995-96, at 20% of cost of land per year. Against Institute's request Government of Kerala is now considering assignment of said land to Institute free of cost and orders are being awaited for the same.

Sd/
FA & CAO

Sd/
Director

Audit Report

Audit Report on the accounts of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram for the year 2001-2002

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 & technology Thiruvananthapuram Act, 1980".

The Institute is mainly financed by grant from the Government of India. During the year grant received is Rs. 2260 lakh.

Comments on Accounts

Balance Sheet

1. Diversion of Plan Grant for Non-Plan Expenditure

The Plan Grants received from Government of India to meet capital expenditure was Rs. 1210 lakh. Out of this, capital expenditure of Rs. 387.24 lakh only

Replies to Audit Comments

Expenditure for Salary & Allowamces 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 Rs. 15.01 crore, while non-

was incurred and Rs. 384.11 lakh was used for meeting recurring expenditure the Research and Academic programme. Hence plan grant of Rs. 438.65 lakh was diverted for meeting expenditure under Non-plan.

Plan grant released is only Rs. 10.50 crores. Institute had taken up with Department of Science & Technology for suitable revision in Non-Plan Grant amount.

2. Liabilities against unutilised grants of sponsored projects.

The liabilities to be discharged by the Institute against unutilised grants received for sponsored research projects are to the extent of Rs. 261.23 lakh. As against this, no deposit was available. Thus grants received for specific purpose were diverted for meeting recurring expenditure of the Institute.

The funds received against Project accounts are deposited in a common account maintained with Bank for Institute. As instructed by audit the receipts against projects will be kept under separate bank account from next year.

3. 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 Balance Sheet showed an amount of Rs. 83.39 lakh as receivable from the EPF Commissioner. However confirmation of the balance was not obtained.

Details of funds receivable from EPF commissioner are maintained separately and were shown to audit. Effort is being made for obtaining confirmation of balance from EPF commissioner.

The Institute owed an amount of Rs. 42.43 lakh to the PF.

The balance due to PF, represents mainly the deduction adjustable from March02 salary which was subsequently transferred to fund during next year. (2002-03)

4. Suspense Account

An amount of Rs. 0.69 lakh being a part of interest received against investment of Technology Development Fund (TDF) was kept under suspense as it could not be reinvested by oversight. Hence TDF and TDF investments were understated to the extent of Rs. 0.69 lakh.

The interest amount received against Technology fund during March02 were invested in Fund during April 2002 and necessary entries were also made in April 2002.

5. Accounting of Assets

The value of assets shown in the Balance Sheet after charging depreciation was Rs. 3670.47 lakh. The Assets register was maintained only from 1998-99. In the previous years the institute stated 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. During the current audit the Institute stated that the value of obsolete assets were adjusted by writing off value of assets every year as depreciation. As charging of depreciation and writing off of obsolete assets are entirely different matters, the institute's reply is not tenable.

A statement of all assets in use was prepared and value of such assets are reconciled with the Balance sheet costs. The necessary adjustment will be made in the accounts of assets and will be shown to audit during next year.

Receipt and Payment Accounts

6. Royalty receivable

During the year, royalty received and accounted for was Rs. 0.95 lakh. However, there is no mechanism in the institute to arrive at how much amount is actually receivable in respect of each Technology so far transferred by the institute. Royalty in respect of Heart Valve and Blood Bag for the year 1999-2000 onwards and for Hydrocephalus Shunt for the year 1998-99 onwards are yet to be received.

Major receipts against Royalty are through NRDC (Under Department of Science & Technology, Government of India). The royalty receipts are being monitored by a senior official of the Institute and will be followed up more vigorously.

General

7. Revision of Accounts

The accounts were revised at the instance of audit and the following major corrections were carried on:-

(i) Pension fund and Pension fund investment

Pension fund and investment against pension fund was reduced by Rs. 8 lakh consequent to rectification carried out in the balances outstanding in these heads.

Provision for Gratuity fund was wrongly included in the adjustment under Pension fund (Rs. 4 lakhs). Additional provision made was reversed and adjusted correctly against Gratuity fund at the instance of audit.

(ii) Gratuity fund

Contribution of Rs. 4 lakh to gratuity fund was provided in the account at the instance of audit and hence the pension fund was increased by Rs. 4 lakh.

Due to revision as detailed above.

(iii) Sundry Creditors

Liability was increased by Rs. 12.66 lakh consequent to provision made for payment of electricity and water charges and write back of excess provision of property tax.

Claim for Electricity and Water charges were received after preparation of accounts statements and hence required revision.

(iv) Interest on investment of sinking fund and Technology development fund.

Interest of Rs. 70.74 lakh and Rs. 16.26 lakh in respect of investment of sinking fund and Technology development fund was shown in the income and expenditure account and Receipt and payment account instead of showing in the Balance sheet.

The receipt of interest for Sinking fund investments and Technology fund investments were directly credited to above Fund accounts maintained as these receipts were not available for regular expenses of institute. However as instructed by audit the interest receipts were also shown in income & Expenditure statement as income (interest earned by funds) and expenditure (interest earned invested in funds)

(v) Effect of Audit Comments on Balance sheet, Income & Expenditure Account and Receipts & Payment Account.

The net impact of the comments given in the preceeding paras is that assets as on 31-3-2002 were overstated by Rs. 8.31 lakh, liabilities over stated by Rs. 8.31 lakh, excess of expenditure over income for the year understated by Rs. 15.00 lakh, Receipts & payment, understated by Rs. 75.48 lakh.

Sd/

Pr. Director of Audit (SD)

Sd/

Financial Adviser & Chief accounts Officer

Sd/

Director

Audit Certificate

I have examined the Receipts and Payment Account, Income and Expenditure Account for the year ended 31st March, 2002, and the Balance Sheet as on 31st March, 2002 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 the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram according to the best of information and explanations given to me and so shown by the books of the organisation.

New Delhi

Dated:

Sd/

Pr. Director of Audit
Scientific Departments