

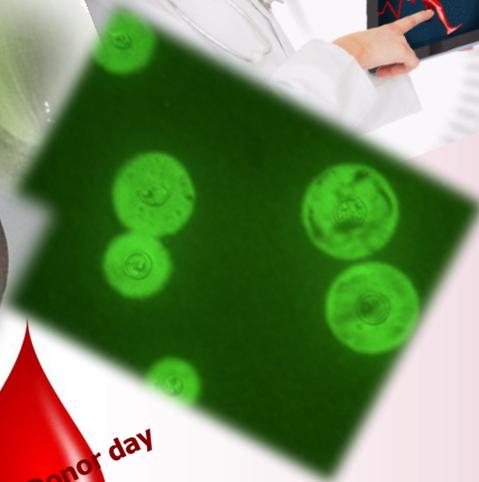
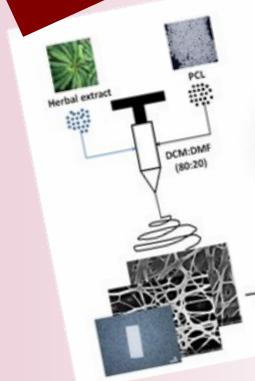
# Chitra Dhwani

Quarterly e-magazine of SCTIMST, Trivandrum, Kerala, INDIA



TO HEALTH CARE 2030!

TELEMEDICINE



World Blood Donor day

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## From Editor....

### A Letter from the Editor

Dear All,

It is very delighting and gratifying to share that the pioneer issue of our "CHITRA DHWANI" could reach the hearts and souls of everyone at large. The overwhelming responses from Senior Faculties, Colleagues, Students and all the Staffs further enthused and motivated us to progress ahead together sharing our innovations and creativities, and to reach newer heights. Our e-zine proved an amazing real-time Treasure-hunt for the Hidden talents amongst us, paving a scintillating conduit for the creative and scientific pursuits.

The cover story on TELEMEDICINE provides a splendid overview on a futuristic stepping stone in healthcare undertaken by SCTIMST, narrating outstanding developments and adding tele-communication flavor to our knowledge that would be a true delight to read.

In the current issue, we have made a beginning to connect to our ALUMNIs by dedicating a special column that would highlight their journey of success that started from SCTIMST one day. Nothing else can be more stimulating for the budding scientists than to have a face to face conversation with the eminent Clinician cum Researcher involved in TRANSLATIONAL RESEARCH. Memory lanes is special as Er GS Bhuvaneshwar agreed to share his initial journey here. During this quarter, excellent New Initiatives undertaken by Faculty as well as Doctoral Scholars forums are aptly stated. We also traversed through the biggest mystery of life, that is hard yet the final destined dialogue in life, the 'Brain Death'. The FUN section is packed with remarkable cartoons, incredible poems, astonishing stories etc.

We welcome suggestions from you about this endeavor, and continue to look forward to your co-operation, support and blessings to further improvise and make it a continued success.

Thanks and best regards

**Kamalesh K Gulia**

Editor

Sleep Research Lab

Comprehensive Center for Sleep Disorders

SCTIMST

## New Directions...

The Institute's heart and soul is often reflected in its in house publications as it brings out not only the achievements of the institute but also the hidden talent of its employees. The work place is rarely the scene where individual talents get expressed and often acts as deterrent to its expression. This endeavor to bring a periodical e-magazine with a mix of science, medicine and technology interspersed with other art forms and social events will go a long way in further bonding of the Chitra family with a unique work ethos.

I am told the e-magazine will have space for all art forms that can be expressed in print and color and it is expected to be of high standard as far as the art forms it will carry, for many years to come. Setting high standard in the initial editions of this e-magazine will provide the bench mark for every subsequent edition to outperform the previous one in content and quality. The Editorial Board has done an excellent job in putting together quality material and transforming it into this enchanting Chitra Dhvani.



**Jagan Mohan Tharakan**  
Director  
SCTIMST

*“The art of progress is to preserve order amid change, and to preserve change amid order”*

## Notions: A need indeed-SCTIMST as Super-specialized CN healthcare Center

In early late 1960s and '70s, there was a surge in the treatment modalities for the cardio-vascular and neurological diseases. Rapid strides in biomedical technologies were the main driving force for this renaissance.

The health care scenario then in India, particularly in South, was primitive at best. The genesis of SCTIMST at this crucial juncture was a seed for excellence in health care and related technology development “down south”. Our Institute caters to the people of not only Kerala, but also other southern states; some patients come from farther states and from abroad.

SCTIMST offers superlative and cost-effective treatment to the suffering millions of cardiac and neurological lesions. Innovations in treatment keep pace with developments in diagnostics. Healthcare costs have multiplied manifold. But, our charges remain one of the lowest and affordable to most of the deserving population. Our research efforts have contributed to development in-house of many devices and facilities to confer financial solace to the patients. Various beneficial schemes offered by governmental agencies and private initiatives help us to mitigate hardship to many patients.

From a few hundreds of patients in the 1970s, we today serve over a lakh of out-patients and perform about 8000 surgical procedures every year, in spite of limited infrastructure. To meet the ever-increasing demands, efforts are on to augment our infrastructure in the near future.

We stride ahead with the satisfaction of meeting the faith reposed in us by our nation, with a resolve that our tradition of ingenuity and innovation with a mix of compassion will continue to serve our people.



**R Sankar Kumar**  
Medical Superintendent  
Professor Senior Grade  
SCTIMST



## Historical perspectives..

### Sree Chitra Tirunal Medical Center:

#### A spark that glittered in service of humanity!

Where there is noble will, there is gracious way.....The Maharaja's benevolence, Government of Kerala's genuine proposal, Department of Science and Technology's resolution were unprecedented, creating an eternal spark in 1973 in Trivandrum that glittered far and wide in service of humanity healing the Hearts & Brains.



*Opening of the Medical Centre by His Excellency Shri V Viswanathan, Governor of Kerala, Shri C Achutha Menon, Chief Minister presided the event*

The founder Director, Dr MS Valiathan's indomitable virtue, conscientious hard work, inherent management skills and disciplined approach helped him to sail smoothly at tremendous pace against the harsh waves of obstacles. A Medical Center started in 1976 transformed fast into a vibrant super-specialty Center serving ailing patients, an hospital equipped with latest equipments attracting the best talents. There was no looking back. Dedicated teams joined hands, administration strengthened and financial support from State and Central Govt began pouring-in leading to a rapid progress.



*Opening of the Out Patient Services by Shri PN Haksar, Deputy Chairman, Planning Commission; Shri C Achutha Menon, Chief Minister of Kerala; Dr M S Valiathan, Director, SCTIMST, and Shri NK Balakrishnan, Minister for Health Kerala*

Wind had changed for extraordinary development on horizons of Trivandrum and a full fledged Surgical Center came into existence. In 1980, SCTIMST attained "An Institute of National importance with a status of University by DST, Govt of India.



*Opening of Sethu Parvathy Bai Surgical Centre by Mrs Indira Gandhi, Prime Minister. Shri Vakkom Purushothaman, Minister for Health, Kerala is sharing dais with Mrs Gandhi*



Sree Chitra Tirunal Institute of Medical Sciences & Technology

## Special Feature

# TELEMEDICINE: THE STEPPING STONE TO HEALTH CARE 2030!

The World Health Organization (WHO) defines Telemedicine as "The delivery of Health care services, where, distance is a critical factor by all health care professional using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interest of advancing the health of individual and their communities".

Telemedicine maximizes utilization of limited resources, saves travel time and money and the patient can access resources in a tertiary referral center without constraints of distance.

### Tele Health & Medical Education Project, Kerala

With the help of ISRO and Govt of Kerala, SCTIMST had anchored a Tele Health & Medical Education project aimed to:

- Enrich the knowledge of medical manpower with the latest developments in the field through Tele education.
- Provide virtual classroom facility in medical colleges in the state of Kerala.
- Improve availability of quality medical services to the patients approaching district hospitals.
- Connect Medical Colleges in the state with the National Institutes so as to enable the doctors to have a network for scientific interaction.
- Provide training to the Doctors, specialists, and site administrators in operation and maintenance of the proposed system.

The project incorporates

1. Tele Consultation,
2. Tele Education,
3. Virtual Class room Teaching, and
4. Live transmission of Surgeries/ Conferences/ CMEs.

The pilot consultation was started on December 2005. There were two more projects which were functioning simultaneously in which SCTIMST is one of the specialist centers.

1. Project by Department of IT
2. Development and pilot implementation of Health Care Delivery System through Telemedicine using

Information and Communication Technologies (ICT) by C-DAC

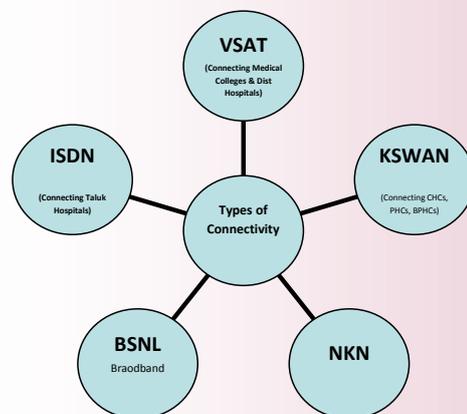
### Centres Connected through ISDN

#### ◆ Tele-Specialist Centres (TSC)

- ◆ Medical College Hospital, Trivandrum
- ◆ SCTIMST, Trivandrum
- ◆ Regional Cancer Centre (RCC), Trivandrum

#### ◆ Tele-Nodal Centres (TNC)

- ◆ Taluk Hospitals at: Neyyattinkara, Mavelikkara, Quilandy, Vythiri, Wayanad
- ◆ Mental Health Centre, Trivandrum



### Centres Connected through KSWAN

#### ◆ Tele-Specialist Centres (TSC)

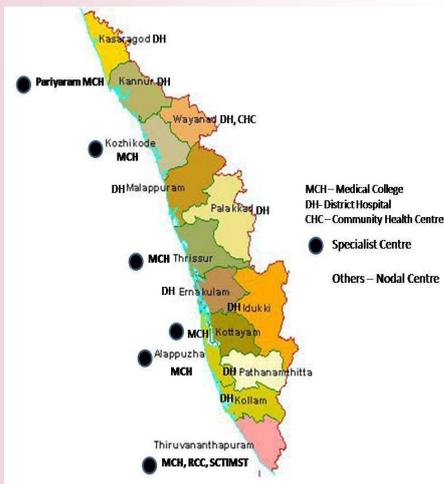
- ◆ MCH, Trivandrum
- ◆ MCH, Kozhikode
- ◆ SCTIMST, Trivandrum
- ◆ RCC, Trivandrum
- ◆ DH, Malappuram

#### ◆ Tele-Nodal Centres (TNC)

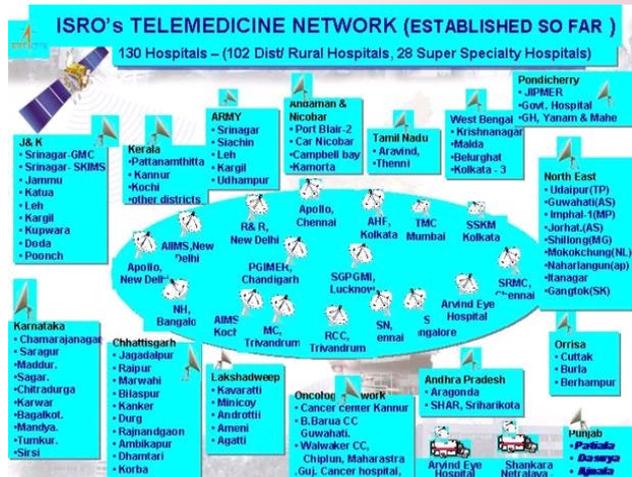
- ◆ BPHC, Vettom
- ◆ BPHC, Valavannur
- ◆ CHC, Purathur
- ◆ CHC, Thanur
- ◆ PHC, Valanchery
- ◆ TH, Tirur
- ◆ PHC, Alemcode

(MCH – Medical College Hospital  
DH – District Hospital  
CHC – Community Health Centre  
TH – Taluk Hospitals  
BPHC – Block Panchayat Health Centre)

The specialists and peripheral hospitals are connected in the network within Kerala and India.



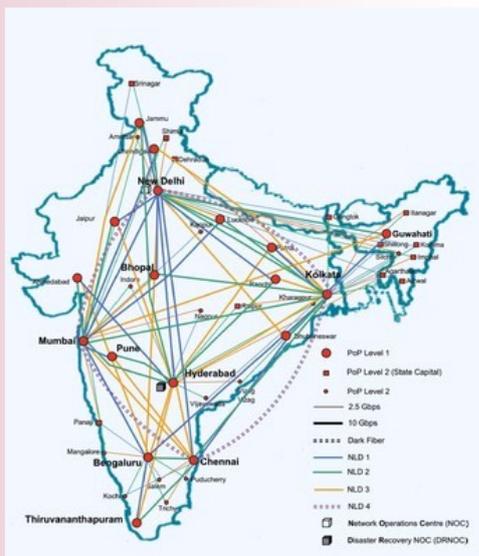
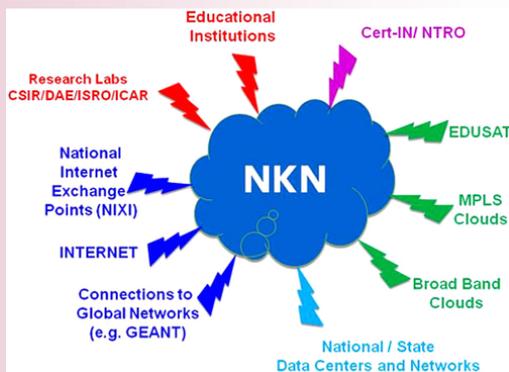
Centres Connected through VSAT (Kerala)



Centres Connected through VSAT (India)

### National Knowledge Network

The NKN is a state-of-the-art multi-gigabit pan-India network for providing a unified high speed network backbone for all knowledge related institutions in the country.



Till date, total tasks completed are:

- ◆ Tele Consultations – 230
- ◆ Tele Education sessions – 439
- ◆ Total project discussions – 45
- ◆ Village resource centre programmes – 5
- ◆ CME – 11

### Tele Consultation

SCTIMST has scheduled consultations by various specialists on all weekdays. A medical administrator is the nodal officer of the facility. A site administrator who is qualified in computer operations and networking coordinates the programme. The peripheral hospitals can contact the Telemedicine facility and obtain an appointment for patient consultation. The data of the patients and images can be sent in advance and subsequently, video conferencing can be done with the patient and doctors at both ends. The facility is utilized by some of the

Medical Colleges, District and Taluk hospitals and Institute like JIPMER, Pondicherry and CMC, Vellore. The facility is also utilized for Follow-up consultations of patients and peripheral outreach programmes.

### Tele Educational, Tele Radiology and Tele Project Discussions

The facility has organized Tele Educational Programmes in various specialties. This includes programmes organized at SCTIMST and many other National Institutes and major hospitals. A series of Tele Radiology programmes with JIPMER, CMC Vellore and Medical Colleges of Kerala were also organized.

The facility is also utilized for Tele Project discussions of projects with International collaboration and presentation of seminars.

### Village Resource Centre Programme:

SCTIMST in collaboration with the State Planning Board had conducted the Village Resource programme. Accordingly, six consultations of health related issues were handled by the experts of the Institute. Through this facility, the doctors give classes to the public at remote locations through

video conferencing. It is also decided to provide Telemedicine connectivity to Mobile Unit of Malabar Cancer Care Society, Kannur for Tele consultation, follow-up and registration for the poor people of North Kerala.

Day	Department	Time
Monday	Neurology	2 PM - 3 PM
Tuesday	Cardiology	2 PM - 3 PM
Wednesday	Neurology	2 PM - 3 PM
2 <sup>nd</sup> Wednesday	Physical Med & Rehab. Clinic	2 PM - 3 PM
Thursday	Cardiology	2 PM - 3 PM
Thursday	Epilepsy	3 PM - 4 PM
Friday	Imaging Sciences & Interventional Radiology	2 PM - 3 PM

### Tele Consultation Schedule

#### International Connectivity:

The use of specialized applications allows sharing of

high performing computing facilities, and large database which can be transmitted to other Centers. NKN International IP enables the faculty and residents to listen and interact with other Centers across the globe.

### Training - Given to Site Administrators & M.Tech Students

SCTIMST has provided training to Site Administrators and M.Tech students in operation and maintenance of Telemedicine facility.

The infrastructure with regard to Telemedicine like video conferencing system, software and PC, facilities for networking like VSAT, NKN etc, and trained manpower for operation of the system are available at the Institute.

According to Dr SK Jawahar, AMO and Nodal Officer, Telemedicine ***"It has huge potential in knowledge sharing and networking which could be utilized by the faculty, residents and other staff"***.

### Tele Education



International Project Discussion

Tele Consultation



(Contributed by Dr SK Jawahar, Administrative Medical Officer and Nodal Officer, Telemedicine at SCTIMST. Ms Liji SV, the Site Administrator in the project TeleHealth and Medical Education.)

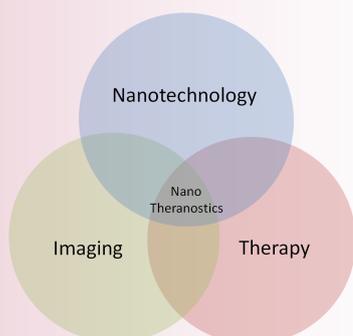
***"It always seems impossible until its done"***

## Emerging Trends in Science....

### Drug Delivery: Current and Future Trends

Over the past several decades, various controlled and sustained drug delivery formulations have been designed, developed and characterized for numerous biomedical applications. However, most of these injectable formulations deliver drugs passively as they do not actively sense and respond to the dynamic pathological milieu resulting in suboptimal release kinetics, undesirable differences in biodistribution, and an increased risk of systemic toxicity. Moreover, as the onset and progression of any pathological condition is highly variable, the subtype and severity of the disease often differs widely among patient subpopulations. Hence, determining effective therapeutic dose and defining the dosing parameters remain key challenges for maximizing drug efficacy and safety. Consequently, the development of dual-acting biomaterials termed the 'theranostics' that could simultaneously diagnose and treat a disease condition at the same time in a single dose holds great promise for the future of biomedicine.

Employing nanotherapeutic-based approaches in combination with a multitude of non-invasive imaging modalities, theranostic nanoparticles are currently being extensively evaluated for diagnosis and treatment of cancer. Therapeutic strategies such as chemotherapy, hyperthermia, and radiation therapy are combined with imaging functionalities such as magnetic resonance imaging, near-infrared fluorescence imaging, and nuclear imaging (PET/SPECT) by incorporating therapeutic moieties and imaging markers concurrently onto a nanoparticle surface for simultaneous diagnostic imaging and targeted ablation of tumors. From a clinical perspective, these strategies provide unique opportunities that allow for feedback mechanisms to understand cellular phenotypes and heterogeneity of tumors, predict patient's response to a specific treatment, and determine on-going efficacy and biodistribution of the therapeutic agent through multimodal imaging.



Despite notable progress and enthusiasm, theranostic nanoparticles also face significant challenges. For example, striking the right balance between diagnostic payloads and therapeutic loading, for optimal imaging without diminishing the therapeutic potency of the nanocomplex, has been proved to be quite a daunting task. Although this shortcoming may be overcome by using nanoagents that are intrinsically theranostic, the stability, safety and *in-vivo* efficacy of these nanosystems need to be addressed for effective clinical applications. Nevertheless, theranostic technologies holds great promise as they possess the unique ability to diagnose, monitor and treat the disease condition simultaneously with unprecedented control as opposed to current therapies that embrace a 'one size fits all' approach. In addition, advances in the development of a truly closed-loop, but monitorable method for delivering therapeutics on-demand will pave the way towards the development of fundamentally new, safer and more effective personalized theranostic therapeutic strategies for the treatment of cancer.

*(Contributed by Dr Shivaram Selvam, DST Inspire Faculty D)*

### Neuroinformatics

Neuroinformatics is an emerging technology and a branch of Bioinformatics. It involves intersection of neuroscience, mathematics and information technology (IT). Neuroinformatics seeks to create and maintain web-accessible databases of experimental and computational data, together with innovative software tools that are essential for understanding the nervous system in its normal function and in neurological disorders. The main goal of neuroinformatics includes (a) developing and applying computational methods to study brain structure, function and behavior, (b) applying advanced IT methods to deal with huge quantity and great complexity of neuroscientific data, (c) exploiting our insights into the principles underlying brain function to develop new IT technologies. The major areas of neuroinformatics covers computational neuroscience, cognitive neuroscience, neuromorphic and neural engineering and software systems for various studies such as artificial neural network modeling, neural dynamics, sensory, motor, and cognitive modeling, statistical modeling, sensory prosthesis,

brain - computer - interfaces, neuromorphic engineering, and robotics. Neuroscience data is diverse and heterogeneous and hence this cross-disciplinary nature of neuroinformatics requires collaboration of teams of scientists with mapping efforts and/or hypothesis-driven goals. Neuroinformatics is becoming essential to neuroscience investigators and clinicians for conducting scientific inquiry, and practicing medicine in our time of rapidly expanding cross-disciplinary knowledge.

### Neuroinformatics @ SCTIMST

In SCTIMST, current work and experiments related to Neuroinformatics has been jointly conducted by research team from Departments of Imaging science and Interventional Radiology, Neurology department & Biomedical technology wing. The institute has a fully equipped Brain mapping laboratory which was set up with the funding of Kerala State Council for Science, Technology & Environment (KSCSTE), Govt of Kerala. The Department of Biotechnology, Govt of India has also funded projects in the field of functional neuroimaging. The various projects are done through high end computers and sophisticated software bought through these funding. The main ongoing projects are:

- Brain mapping by functional magnetic resonance imaging (fMRI), Diffusion Tensor Imaging (DTI) and Voxel Based Morphometry (VBM) for presurgical lateralization of language function in epilepsy patients.

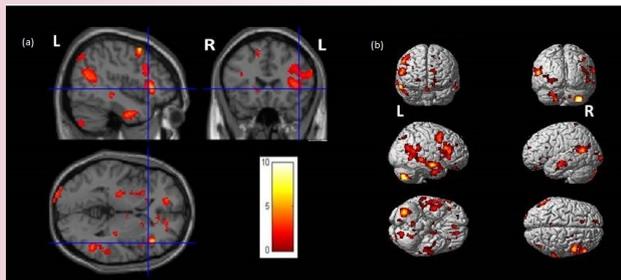


Figure 1: (a) Orthogonal views and (b) rendered views of brain with left Broca's and Wernicke's area activation generated by fMRI language (visual verb generation) task in a right handed subject. The color scale corresponds to range (red to hot) of fMRI activation. Hot color represents high intensity and red color represents low intensity activation.

Different visual (verb generation, syntax, semantics) and auditory (passive listening, story telling) fMRI paradigms (experimental tasks) are employed to generate language activation patterns (Fig. 1 & 2) and its most activity usually found in Broca's area (language expression) and Wernicke's area

(language comprehension) of the dominant hemisphere, which is very clinically relevant in presurgical evaluation of epilepsy patients.

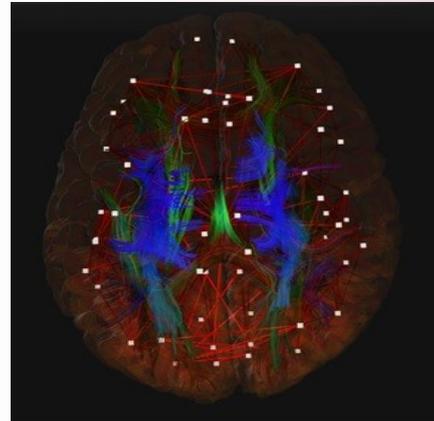


Figure 2: 3D visualization of brain structure showing pial surface, Region of Interests (ROIs), White matter fiber tracts and patterns of functional connectivity.

- Voxel Based Morphometric (VBM) analysis of subcortical brain structures in Fronto Temporal Dementia (FTD), Mild Cognitive Impairment (MCI) and Alzheimer's Disease (AD) patients
- Functional magnetic resonance imaging combined electroencephalography (fMRI-EEG) to study electrical activity of brain in correlation with BOLD (Blood Oxygen Level Dependent) haemodynamic changes during electrical activity associated with epileptic disorders
- Brain Computer Interface (BCI) based real time fMRI (rtfMRI) study which involves neurofeedback training for self-regulation of Broca's area in post stroke Broca's aphasia patients.
- Cerebro Vascular Reactivity (CVR) assessment using BOLD fMRI breath hold technique in patients with large vessel occlusions. This can serve as a non-invasive tool for mapping exhausted cerebrovascular autoregulation in patients with a compromised cerebral vasculature. This project is funded through the intramural funding of the institute.

(Contributed by Ms Jija James & Dr C Kesavadas, Professor at Dept of Imaging Sciences and Interventional Radiology)

**“Disciplined, integrated and interconnected dependence is the key of attaining INDEPENDENCE at large. We should learn how to fly with our thoughts, see dreams with open eyes and try to fruitify them”**

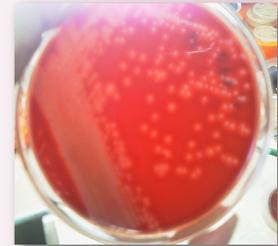
**Chandra P Sharma**

## A day at the Department of Microbiology..Bugs, Bugs, Bugs!

Neurologist on his rounds in the ICU: "This encephalitis patient was getting better yesterday. What has happened now?"

Senior Resident: "Sir, I think there is a shadow in his right lung and he has purulent secretions. He has pneumonia and we have to find out the bug. A sample of his tracheal aspirate has been sent to the Microbiology lab this morning."

Neurologist: "Good. You have done the right thing. Now, start the best antibiotic available. We can change to the appropriate antibiotic after culture report is got. He is a young patient, the bread winner of his family and we cannot afford to lose him. But for the infection he would have been off the ventilator....."



Blood agar with hemolytic colonies

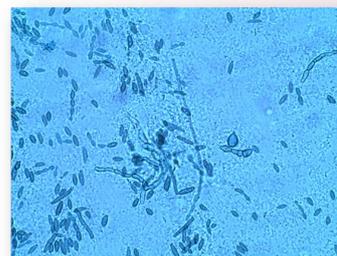
History speaks for itself how time and again microscopic creatures, which are invisible to naked eyes, have terrorized the human civilization. The microbiologists undertake a vital role in identification of the disease causing organisms. The Microbiology Department specializes in testing for all the crucial microbes relevant to the Super-specialty Cardio-Neuro Center that functions at SCTIMST. As the microbial world is very diverse, the task of microbiologists becomes more challenging to cover all the different types, each needing their own specific environment and growth factors. The department conducts the tests in most categories: Bacteriology, Mycology, Serology, Virology and Molecular biology and works round the clock.

Bacteriology deals with diseases caused by bacteria. The specimens mainly from patients who have been admitted here for surgery or for medical conditions that require intensive care treatment that led to infective complications are tested here. Majority of the specimens received here are aspirates from endotracheal tubes and urinary catheters, blood from cannulas and CSF from tubes put to drain CSF from the ventricles and it is often difficult to decide whether treatment in the form of antibiotics is really required. Microscopy helps by showing the presence of pus cells. An important criterion for urine culture is whether there is significant growth, i.e. more than  $10^5$  bacteria per ml of urine which is established by quantitative culture. This is called cfu or colony forming units in the sample.

Respiratory microbes are isolated from sputum or endotracheal samples, from those on ventilator. The broncho-alveolar lavage specimens are also received occasionally and they are the best and most representative samples from a patient on ventilator, to diagnose Ventilator-Associated Pneumonia (VAP). Throat swabs and Nasal swabs are routinely done before neurosurgical procedures that have an approach through the respiratory

tract and also in case of device implantations like pacemakers and deep brain stimulation devices. These are screened for pathogens like *Staphylococcus aureus*, Pneumococcus and *Hemophilus influenzae* that may cause infection later. Cerebrospinal Fluid and other sterile aspirates: Being a super-specialty centre, standard pathogens are very rare. Post-operative meningitis is generally caused by gram negatives like *Pseudomonas*, *Acinetobacter*, *Klebsiella* etc.

For blood culture, aerobic and anaerobic blood culture bottles are issued. In case of an unexplained fever in a hospitalized patient it is best to send two samples from two sites in two aerobic culture bottles. Anaerobes are generally recovered only from brain abscesses. Another category is Infective Endocarditis due to some Streptococci that grow only in an anaerobic environment. Device tips – The only device tip that is acceptable according to the latest standards is the Central line tip, and this has to be accompanied by a blood culture for seeing whether the organism has caused real infection or is just colonizing the line.



Fungus after growing in special media

Pus and other tissues from infected sites – Pus swabs are the commonest specimens in this category. A single swab can be

cultured only, while a double swab from the same site can be stained and reported. However, the best specimen is a pus aspirate or tissue as such from the infected site.

We grind the tissue so that all organisms are released from inside and grow in the media. Hence it is best to leave the inoculation into anaerobic bottles to us.

Thanks to advancing technology, helping us in Bacteriology are the two machines- BacT Alert for making blood cultures automated and the VITEK that gives the crucial information on Identification and sensitivity in MIC of the isolated strain. Some bacteria like *Stenotrophomonas* are inherently resistant to all antibiotics except Co-trimoxazole.

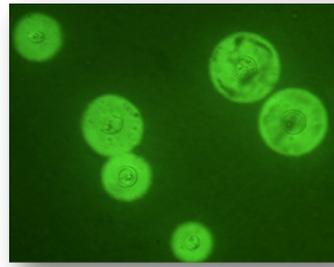


They may be mistakenly reported as sensitive by conventional methods. VITEK gives the Identity within 24 hrs, which is impossible by manual methods. *Enterococcus gallinarum* infective endocarditis cannot be treated by Vancomycin due to inherent resistance and this identification cannot be done in a routine microbiology lab without VITEK. The diagnosis of tuberculosis is usually done by the bacteriology lab, but entails a long incubation. There are facilities for both conventional LJ medium inoculation and the MB Bact automated system for sterile fluids. The automated system gives quicker results.

The CSF, blood, tissue bits and pus are received for fungal culture. Even if Indian ink does not reveal cryptococci, the BacT Alert system yields growth, hence such a CSF is also inoculated into blood culture bottles in the laboratory. Moulds take longer to grow, hence all specimens that do not grow yeast, are incubated for the next one month to rule out mould infections.

Routine antibody detection for HIV, HCV and for HBsAg are done on serum samples of almost all patients admitted here, and also in all patients that undergo invasive procedures on outpatient basis.

This is done by the VIDAS machine that can take individual samples as they come to the lab and is fully automated. Conventional tissue culture is still done for the Coxsackie viruses that cause myocarditis.



Cryptococcus with large capsule in CSF

In Serology, the reaction of the body to the invasion by microbes is detected with the help of acute phase proteins like C-reactive protein

(CRP), antistreptolysin O (ASO) and Rheumatoid factor. This is done with the help of the Nephelometer that gives accurate values which characteristically drop steadily in decimal points as the infection recedes. This is of immense help to the clinician in monitoring treatment. Procalcitonin is a new marker of sepsis done on the VIDAS machine. Done serially, it shows response to treatment.

For Molecular Biology, nowadays a basic PCR system is an integral part of every Microbiology lab. Here this system is used mainly in the diagnosis of tuberculosis from CSF and other sterile fluids directly. When an RT-PCR system is established more diseases will be covered in the future.



There are three faculty members, two scientific officers and four technicians to manage the different sections. A unit helper and a G4 employee helps in the crucial business of decontamination and sterilization. There is an apprentice trainee programme for MSc graduates and an Observership programme for MD students. Those who have just finished vocational higher secondary (VHS) course can also get a feel how it is to work in a laboratory and decide on their future career. Dr Kavita, HOD, manages the applied microbiology part of relating the isolates to the treatment decisions taken, while Dr Molly with the help of the other scientists looks after quality control and the smooth processing of samples.

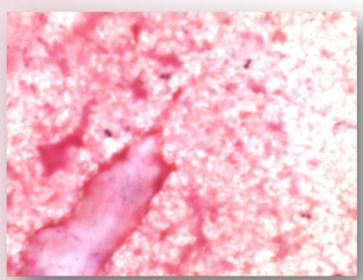
## Translational Research

### A conversation with Dr Asha Kishore.....



The Infection Control Team (ICT) meets regularly and takes decisions on how to reduce infections. The Head of Microbiology is a member of this team, and helps in data collection which is essential in any surveillance and prevention programme. According to Dr Kavita, the Head of Microbiology Dept, ***“Hospital acquired infections form a good part of the infections diagnosed in the microbiology lab. Though preventable, they cannot be fully eradicated, especially in chronic and immunosuppressed patients. The Microbiology lab supports the Hospital Infection Control Unit by giving timely reports on increasing infections in a particular unit, so that quick preventive measures are initiated before an outbreak occurs”.***

The Department also engages actively in the Homograft project. Repairing congenital malformations of the heart using a homograft is based on proper harvesting, testing and storage of the valve tissue (using liquid Nitrogen), before it is transferred to a patient. This core function is carried out by an efficient team attached to the Homograft lab that ensures the sterility and viability of the tissue harvested from the heart of a cadaver. It is done in collaboration with the Forensic Science Department of the Govt. Medical College, Trivandrum.



Valve tissue with vegetation showing Gram positive cocci in pairs

**“Team work is the key to every success and is the motto of the Microbiology Department!”**

*(Contributed by Dr Kavita Raja and her team at Department of Microbiology)*

**“Do not go where the path may lead, go instead where there is no path and leave a trail”**

Dr Asha Kishore is the lead clinician and researcher of the Comprehensive Care Centre for Movement Disorders Clinic (CCCMD). Her clinical interventions and research are underpinned by International collaborations aimed at understanding the occurrence, etiology & possible interventions for Movement Disorders (M.D.). Excerpts of the interview:

Q: Describe a typical work day for you at your movement disorder center!

Reply by AK: It's more of a typical week! The activities in the Center include the M.D. clinic, pre-operative patient evaluations, Deep Brain Stimulation surgeries, post operative programming sessions, Botulinum toxin clinic, Non invasive Brain stimulation Lab-related clinical and research activities, academic programs for the PhD & PDF scholars and research fellows, project development, data analysis, manuscript preparation etc. All these are made possible by my team of colleagues including Dr Syam & Dr Krishnakumar at the M.D. centre.

Q: What makes practicing neurology enjoyable?

AK: Like most neurologists, I too enjoy solving difficult clinical challenges and translating new theoretical knowledge to bedside succour. Helping patients is particularly rewarding, but distilling information from various sources into practical solutions has its own thrill!

Q: Could you provide an overview of your current research activities?

AK: These are aimed at understanding disease mechanisms underlying various movement disorders. We are investigating the role of disturbances in motor cortex plasticity and the involvement of cerebellum in Parkinson's disease (PD) dystonia etc. Basic research into mechanisms of cell death related to deposition and clearance of alpha-syn-nuclein in PD are the theme of 2 of our PhD scholars' projects.

Q: The best treatment for PD in India, is that available in SCTIMST?

AK: Currently there is only symptomatic treatment available. We are interested in developing strategies aimed at the synaptic mechanisms and not merely neurotransmitter replacement therapy.

Q: Current research scenario of PD in India and drawbacks? Where does SCTIMST stand?

AK: SCTIMST is the pioneer in the field of movement disorders with the institute developing the first comprehensive program and being involved in research in this field. The Non invasive brain stimulation research work here is also the first of its kind in India, and performed at very few centres across the world. To be the front runner, SCT need to develop more specialized activities, further strengthen the research and innovation-stimulating environment and nurture raw talent.

Q: Where do you see SCTIMST after 10 years at our current progress rate?

AK: To maintain our flagship status, SCTIMST has to grow strong interdisciplinary teams. International collaborations will help seed new ventures, set new standards and develop cutting edge projects e.g. in genetic epidemiology, that requires large capital expenditure.

Q: What drives you in work and life?

AK: Excellence is an ideal that stimulates me and I find the chase for it, in whatever small way, very gratifying.

Q: What are the things that you miss the most at this point of your life?

AK: I have started feeling the need for a strong academic and research environment to grow any further. It is very important to have like-minded colleagues and work partners with the same passion and to be involved in sustainable collaborative work to broaden one's horizons.

Q: How do you spend your free time? hobbies?

AK:(smiles) I do not have much free time, but work is enjoyable and that compensates. I'm interested in trekking, spending time close to water bodies, waterfalls. I also enjoy relaxing with a good book, with preference to reading autobiographies. I liked Chitra Dhvani!

Q: As a women scientist and subspecialized neurologist, what challenges do you come across?

AK: There are general difficulties in breaking new paths in any environment, unrelated to gender. I was able to generate a crore from external agencies 16 years ago to develop the CCCMD. The administration and departments of Neurology and Neurosurgery gave the rest of the support. As a woman, I strongly believe in equality in all spheres of life. I have become aware that women have to work doubly hard and struggle more, to be duly acknowledged for their work or be given responsible positions.

Q: A message that you would pass on to future aspirants who wish to enter neuroscience?

AK: Be **"a die hard optimist and be inspired by one's aspirations"**. The brain is a fascinating organ and opportunities are expanding with technology progressing so fast. One should identify a key problem, visualize the opportunities, interact with the right people, and find the right place. **"Keep alive ones curiosity and the zest to find solutions"**.

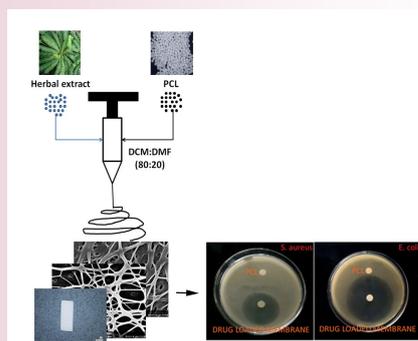


The interview was conducted on 27<sup>th</sup> July 2013 by Francis, Sudhin, Neelima & Arathi.

## Research Highlights ....

### A prospective antibacterial wound dressing from Mukkuti !

In recent times, research on plant extracts has increased across the globe owing to their immense potential to heal life-threatening diseases. Mukkuti (Malayalam name for *Biophytum sensitivum*) is used as traditional medicine to cure variety of diseases. During the last few decades, extensive research has been carried out to elucidate its chemistry, biological activities, and medicinal applications. Extracts and its bioactive compounds have been known to possess antibacterial, anti-inflammatory, antioxidant, antitumor, radio-protective, chemo-protective, anti-metastatic, anti-angiogenesis, wound-healing, immunomodulation, anti-diabetic, and cardio-protective activity.



*Figure: Electro-spinning of crude extracts of Mukkuti and PCL to form antibacterial fibro-porous membranes.*

Dr Ramesh P (In-charge of the Polymer Processing laboratory) and his team fabricated a fibro-porous wound dressing with anti bacterial activity from polycaprolactone (PCL) solution containing crude extract of Mukkuti, a potential antibacterial herbal drug. They used high resolution scanning electron microscopy to prove that the drug loaded PCL membrane displayed a smooth fibro-porous morphology with more interconnective junctions with an average diameter between 1 to 3  $\mu\text{m}$ . Physical characterization of the membrane revealed that it has excellent mechanical stability, water vapour transmission rate, and that it promoted water uptake. The release characteristics by total immersion method in phosphate buffer and acetate buffer displayed an increase in drug release with time. This was followed by testing the anti bacterial activity of the membrane against standard strains of bacteria named *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. Coli*). Arjun GN, Senior research fellow, who conducted these experiments, found that PCL membranes loaded with the drug extracts were able to inhibit the growth of both Gram positive & negative bacterial strains. The important finding published in **J Appl Polym Sci. (Vol 129: 2280–2286, 2013)** indicated that this fibro porous membrane containing Mukkuti could act as a potential wound dressing material to treat various wounds.

### Kerala Doctors in need of physical activity!

Call for Exercise Reiterated: Doctors, patients and general population



**P**hysical inactivity is one of the major risk factors for non-communicable diseases. In order to promote

physical activity among the general population, doctors need to engage themselves in physical activity and advise physical activity for their patients. There is worldwide concern and research going on this issue. A study carried out by the Public Health Team of AMCHSS found that a majority of doctors in Trivandrum city were physically inactive, and did not ask or advice their patients on physical activity.

In this timely and well-conceived study, Dr Patra, Mini, Mathews under proficient leadership of Dr Thankappan (Head, AMCHSS), conducted a cross-sectional survey among 146 doctors (median age 42 years; men 59%), selected by multistage random sampling. Information on demographic details, self-reported physical activity and counseling offered to their patients was collected using a pre-tested structured and self administered questionnaire. Multivariate logistic regression analysis was done to find the predictors of self reported physical activity and counseling practices. Moderate physical activity was reported by 37.7% of the doctors and the remaining 62.3% reported being inactive. Doctors who received motivation for physical activity, who used exercise equipment at home, and those who used neighborhood facility for physical activity were more likely to do moderate physical activity compared to their counterparts. Twenty five percent of the doctors always asked and advised their patients on physical activity. Interestingly, the doctors who believed that their own healthy life style influences advice practices, who consulted less than 30 patients per day and those who engaged in previous sports activities were more likely to always ask and advice their patients on physical activity compared to their counterparts. The study recently reported in **British Journal of Sports Medicine (British Journal of Sports Medicine, June 14, 2013, Epub ahead of print)** provides crucial insights into measures that are required to enhance doctors' own physical activity and counseling practices.

### Chitra's Movement Disorder Team knocks the Little Brain:

Novel mechanisms identified for the abnormal movements in Parkinson's disease

**T**he production of normal, smooth movements requires complex planning and the timely involvement of numerous areas in the brain. The concerted commands required are issued and adapted to a given context, and are integrated

with the information from within and outside the body. Impairment in the functioning of any element in this chain of command will result in movements unsuited for the desired aim or unwanted movements. The primary motor area of brain (referred as M1) that receives input from several cortical and subcortical regions of the brain (e.g. basal ganglia, cerebellum) controls motor performance and learning of new motor skills. Plasticity is the ability of brain to enhance or depress its synaptic function based on the ongoing activity and this property of M1 is important both for motor control and motor learning. Parkinson's disease (PD) is a neurodegenerative disorder in which there is massive loss of dopamine-producing cells (a chemical produced in an area of brain called substantia nigra) that leads to severe abnormalities of movements and impaired motor learning.

The energetic and devoted Chitra's team of researchers at CCC Movement Disorders headed by Dr Asha Kishore has elegantly demonstrated how dynamic changes in plasticity occur in the M1 area during the course of PD, and in response to treatment using the contemporary, noninvasive brain stimulation technique of transcranial magnetic stimulation (TMS). The most accepted treatment for PD is dopamine replacement which has the side effect of causing disabling involuntary movements called levodopa-induced dyskinesias (LIDs). LIDs are thought to arise from abnormal signaling in the basal ganglia due to the nonphysiological release of the exogenously administered dopamine for treatment. M1 plasticity is severely impaired in PD and even worsens with dopamine treatment in patients with LIDs. Dr Asha Kishore and her international collaborative team reported that the plasticity induced in M1 is regulated through the little brain called cerebellum by processing sensory input to M1, based on study conducted in healthy young adults (**published in Cereb Cortex 2013; 23: 305–314**).

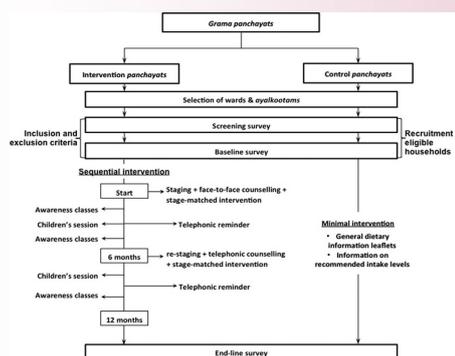
The more recent well-designed study by the Movement disorder team produced exciting results challenging the prevailing view that little brain has only a compensatory role in PD (**published in Cereb Cortex 2013doi:10.1093/cercor/bht058**). Their results suggests that alterations in cerebellar sensory processing function in advanced PD plays an important role in generating LIDs and impairing the plastic properties of M1. It also highlights the functional significance of the newly revealed anatomical connection between basal ganglia circuits and cerebellar circuits in humans through which abnormal signals can propagate among the different motor circuits and cause movement disorders.

## To study dietary behavior change in rural Kerala:

Design & methodology of a community-based trial

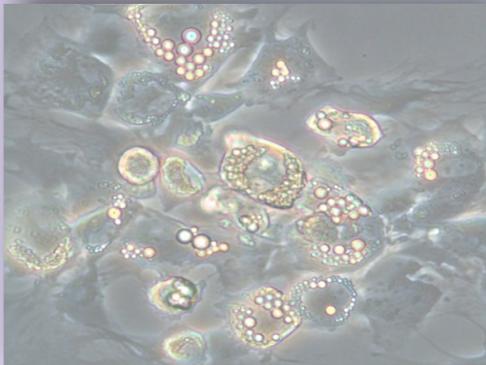
**D**iets having a high sugar, salt and fat content are a major risk factor for many non-communicable diseases, and this has motivated interest in studying whether it is possible to influence these dietary patterns. The "Behavioral Intervention for Diet" study undertaken in rural Kerala attempted to answer this question. The design of this community-based intervention study to change dietary behavior among middle-income households in rural Kerala is elegantly described in the recently published article in **Glob Health Action (2013, 6: 20993 - <http://dx.doi.org/10.3402/gha.v6i0.20993>)**.

This was a cluster-randomized control trial to assess the effectiveness of an intervention to bring about changes in household dietary behavior. It targeted the procurement and consumption of five dietary components: fruits, vegetables, salt, sugar, and oil. Six out of 22 administrative units in northern Trivandrum district were randomly selected and allocated to intervention or control arms. Trained community volunteers carried out data collection and intervention delivery. An innovative tool was developed to assess household readiness-to-change, and a household measurement kit and easy formulas were introduced to facilitate behavior change. The 1-year intervention included a household component with interventions at 0, 6, and 12 months along with counseling, telephonic reminders, home visits and general community awareness sessions in the intervention arm. Households in the control arm received information on recommended levels of intake of the five dietary components and general dietary information leaflets. Formative research helped contextualize the design of the study to ground realities of current dietary procurement, preparation, and consumption patterns in the communities. The study also addressed two key issues: the central role of the household as the decision unit and the long-term sustainability through the use of existing local and administrative networks & community volunteers.



**Science Images from our research  
In quest of Artistic Titles.....**

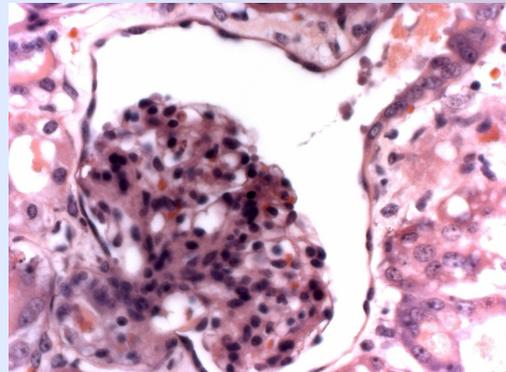
A



Differentiation of adipose derived stem cells to Adipose Cells characterized by globular accretions of lipids

Contributed by TEM group, BMT wing

B



Micro-section of kidney capsule

Contributed by Dr Sabareeswaran A (Histopathology lab)

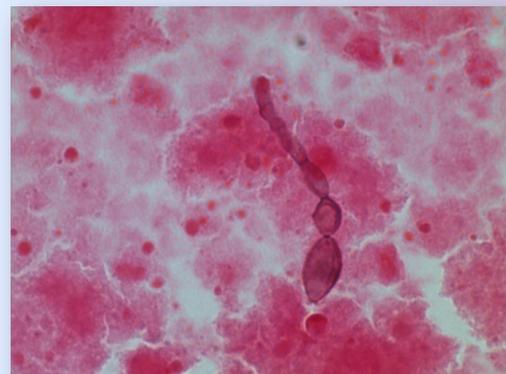
C



Adipose cells seen through transmission electron micro.

Contributed by TEM group, BMT wing

D

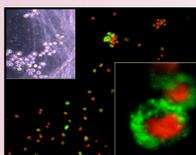


Fungus seen in pus from brain abscess

Contributed by Dr Kavita Raja (Microbiology team)

Entries are invited for a suitable artistic title for these scientific pictures. The winner entries for each picture will be announced in next issue.

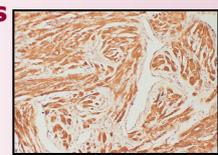
A



**Celestial Flowerings**

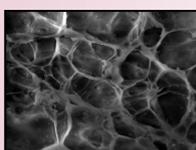


**Wooden Jewels**



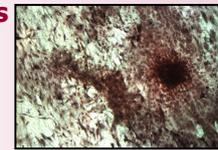
B

C



**Icy Brinjals**

**Autumn spots**



D

**Winner (1st & 2nd issue picture Titles)  
Thomas TA, Scientific Officer  
Biochemistry (Central Clinical Lab)**

## Memory Lanes...

### Chronicle of a Young Biomedical Engineer

#### *The Beginnings of the Chitra Valve Development*



Dr GS Bhuvaneshwar conducting steady flow test on artificial heart valve

#### **Trivandrum, May 1975 --**

Can't believe it is 38 years since my first visit to Trivandrum! I was writing my MS dissertation at IIT Madras - having designed and demonstrated the working of a prototype myoelectric hand prosthesis. Like any other young dreaming electronics engineer -- my ambition was to work in a good hospital and develop novel instrumentation. Sree Chitra Tirunal Medical Centre had advertised for the post of a Biomedical Engineer for the hospital.

Looking back, the attraction was no doubt his personality -- the excitement and positive aura of great opportunity that Dr MS Valiathan gave out. Many may not know - he was also an excellent teacher. During 1973-74, as Visiting professor at IIT Madras, he gave two courses titled "Engineering Physiology - 1 & 2" -- two of the best I have taken. He taught us the various biological systems -- with a simplicity and clarity that comes only from great teachers. Cardiovascular system was my favorite -- and even today I remember his very words explaining how our body controls blood pressure -- feedback from the baroreceptors, the action of the arterioles in controlling resistance; or how cardiac output, heart rate and Starling's law work; brain perfusion and its link to pCO<sub>2</sub>, etc, etc. It seems like destiny was at play - preparing me for my future role.

This post of Biomedical engineer seemed a great opportunity. My good friend Bala, who was doing his PhD was tipped to be the strongest contender; we all knew that Dr MSV was very impressed with his hands-on skills with pumps and equipment. But, what Dr MSV did not know was that, he had applied for a Canadian immigrant visa, which was due anytime. My chance of getting the job looked pretty good. The interview (conducted in the hall which later became the Cardiology ICU) went very well for both of us. As predicted, Bala did get the

offer first; after a month of dillydallying, he decided on Canada. I was eagerly waiting for the letter of offer from Trivandrum; but Dr MSV had other ideas for me. Looking back now, I must agree that he was absolutely right - the job was not for the likes of me.

#### **Bombay, November 1975 --**

I was working for Prof NH Antia, the renowned Plastic surgeon and a leprosy protagonist in his Foundation for Medical Research, located at the JJ Hospital. I was tasked with the job of measuring sciatic nerve conduction velocities in rats, infected with leprosy bacteria. Bombay, despite its reputation of being the Mecca for a young engineer in search of jobs, was a difficult city for me to come to terms with -- very noisy, crowded and very unlike what I had been used to in Bangalore and Chennai. Further, working as a young engineer, fresh out of college, without any experience, amongst a group of biologists - trying to dissect out the sciatic nerve in mice -- and measure its conduction velocity -- all without any training and someone to hold hands was quite a 'nerve wracking' experience. Maybe, destiny had other ideas, when this "blue inland letter", (something we rarely see nowadays) landed in my hands.

One evening, on coming back to the flat in Sion, where I was staying with my good friend and classmate Raman, I got the letter from Dr MS Valiathan. He asked me if I would be interested in joining the DST funded project just then been sanctioned for the development of a "Indian heart valve". The offer for the post of a Biomedical Engineer at a handsome salary of Rs.1000/- per month was quite attractive. I felt very happy and elated to receive this letter at that time and frame of mind. But it also put me in a difficult spot. Just 6 months back, I had accepted a similar handsome offer from Prof Antia and had moved to Bombay in September 1976. My good friend Raman told me that I would be an idiot to leave Bombay for a godforsaken small town; if I did not like the present job, I could easily find another one there in a few months time!! Logic and common sense was probably on his side, but my heartstrings were pulling in the direction of Trivandrum. It took me a week to work up the courage and inform Prof Antia of my dislike of Bombay and desire to take this new opportunity. As many great men, he quietly accepted my decision without any questions and agreed to relieve me by the end of the week. Dr Antia was later awarded the Hunterian like Dr Valiathan and the Padmasree for

his seminal contributions in the new understanding and treatment of leprosy that he brought out in his foundation.

#### **Trivandrum, 12th January 1976 --**

I landed at Trivandrum by the metre-gauge train from Chennai-Egmore and reported to Dr MSV at his temporary office in the first floor ward of the Medical centre block. He briefly told me of the project and its objectives and asked me to complete the formalities for joining. He also introduced me to Dr Shanmugam of Microbiology, who took me to see a two-bedroom flat in Tagore Gardens and meet the owner. After Bombay, the Rs 200 rent seemed very cheap and a godsend - I readily accepted and got the keys right there. He then took me for lunch at the Medical college co-operative canteen next door -- where I had my first taste of how really "hot" a Kerala hotel sambar and rasam could be and the consequences of imbibing it heartily.

After filling up the forms etc., the ubiquitous Mr Narayanaswamy arranged for my medical tests for the next day. In the evening, I vacated my room at the lodge near the railway station and moved into flat - what an unforgettable night it was! The effects of the 'hot sambar' started telling around midnight with severe stomach ache -- I still remember my Ooohs and Ouchs! I kept drinking water from the kitchen tap and by morning the pains abated somewhat. My first lesson on local food learnt!

#### **Trivandrum, 14th January 1976 --**

Armed with the medical examination reports, I formally joined the Centre in the morning. As the great well wisher he is, Mr Narayanaswamy made sure that the time was right and auspicious to get me wedded to the Centre and Trivandrum -- and looking back, the time and day must have been most auspicious, for me to end up spending the next 36.5 years there!

Once the formalities were done, Dr MSV showed me the rooms he had allotted for the project -- one large empty hall of about 1000 sq ft in the ground floor of the newly constructed Administrative Block and a smaller room next to it as a sitting space and asked to me order the necessary furniture. He also told me about Venkatesan, another biomedical engineer who would be joining the project by the end of February and that our responsibility in the Heart valve project was only "Testing". While NAL, Bangalore would design and prototype the valves, we would be responsible for testing them - both 'in vitro' and 'in vivo' -- two new words to my growing biomedical vocabulary. He asked me to read up on Pulse duplicator and Accelerated durability testing and start work on the design, development and setting up of our own systems. He then gave me

two books from his personal collection -- both published in US during the 60's -- based on two symposiums that been held there on heart valves (later he donated these to our library at the time of his retirement). He also told me to refer the back volumes of the Transactions of the American Society of Artificial Internal Organs (ASAIO) that had already been stocked in the library. These were to be my bibles for the next 6 months.

#### **Trivandrum, January 1976 onwards ----**

I got down to reading the books and the ASAIO transactions. In them I found some excellent articles on the two test systems. I still vividly remember how I garnered DW Weiting's design details from his articles. The accelerated tester was a bigger challenge -- I could get only the basic design principles from the articles, particularly one from the Bjork-Shiley group as being more suitable for our purposes. So, the design of the accelerated test system had to be done from scratch. My B Tech training in mechanical drawing and design as well the workshop training and experience in the development of my myoelectric hand -- all came in handy and provided the foundation for my work at Chitra. Engineering design, I found was something I loved doing - a far cry from dissecting mice. The green tranquility of Trivandrum, books on fiction readily borrowed from the British Library and the Water-works swimming pool -- all put together, I must have been like Bertie Wooster (of PG Wodehouse novel's), saying "My cup of joy runneth over".

And that friends, was how the development of the Chitra Heart Valve started -- not with the valve itself, but with the design of the two major test systems. When we look back today, we realize how Dr Valiathan's foresight in setting up the test and evaluation platforms was a major success factor for the future -- not just for the heart valve - but for all the devices that we have developed and successfully commercialized there.



GS Bhuvaneshwar  
Chennai  
24th June 2013

*(Er Dr GS Bhuvaneshwar served as the head, division of Artificial Internal Organs from 1983 to 2002; also as SIC of "Division of Artificial Organs" from 2002 to 2012 and as The Head of the BMT wing, SCTIMST from 2000 to 2012. We are grateful to him for sharing his valuable moments in life through Chitra Dhwani)*

## New Director



**Dr Jagan Mohan Tharakan**, Professor (Senior Grade) and HOD Cardiology took charge of Director from Dr K Radhakrishnan on 16.07.2013



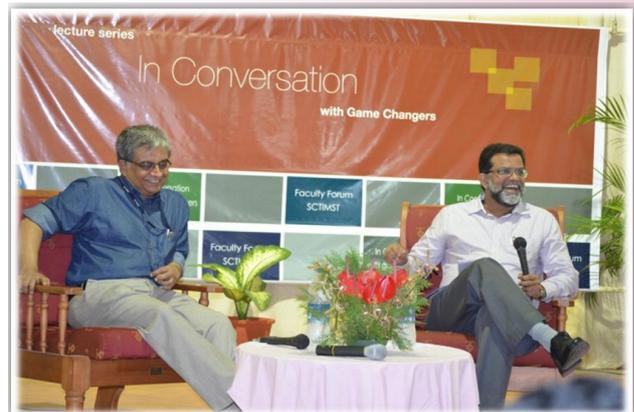
## New Initiatives

### In conversation with game changers

The Faculty Forum initiated its "In conversation with game changers" programme by inviting Shri Rajeev Sadanandan, IAS, Principal Secretary (Health), Govt of Kerala to share his views and have an open discussion on the health issues in Kerala. Prof V Ramankutty, AMCHSS was the moderator for this event which commenced sharp at 4:00 pm on 1<sup>st</sup> July 2013 at the BMT wing Natakashala.

The event was designed to be an informal and interactive discussion with the guest without relying on a prepared presentation. Mr Rajeev Sadanandan, given his mastery and deep insights on the subject as well as data at fingertips, soon bowled over the audience. He described with a historical perspective, the health management practices in the state and analyzed the reasons for the state being regarded as a model of development globally. However, the slowing of investments in the last few decades in health had hampered the health management in the state. The state continued to be reeling under the pressures of chronic and communicable diseases. The public apathy and lack of community participation in solving problems such as waste management also contributed to the recent widespread incidences of dengue and other outbreaks in the state.

He described his efforts in piloting ambitious programmes like an e-health programme for electronic management of personal health information in the state. The audience showed great enthusiasm by posing a number of questions on thought provoking issues on health which was very deft fully answered by the speaker. Dr CP Sharma, Head, BMT wing presented mementoes to speaker and moderator. Dr Anoop Kumar welcomed the gathering and Sri S Balram proposed the vote of thanks on behalf of the faculty forum.



## New Initiatives

### Mentor Talks series: Initiatives by SCDSF

Sree Chitra Doctoral Scholars Forum (SCDSF) hosted a talk entitled "Who is Afraid of Research? A Talk on Creativity, Research Methodology & Research Process Management" by Dr Achuthsankar S Nair, Head, Dept of Computational Biology & Bioinformatics, University of Kerala at the Seminar Hall, BMT Wing, SCTIMST on 26.06.13 at 2pm. The talk is the first of a series of Mentor Talks, which are being planned to enhance interaction of budding researchers with experts in the field of science and technology. The Forum hopes that by providing such a platform young minds will gain inspiration from valid role models as well equip them to navigate better the nitty gritty of surviving in science.

Dr CP Sharma, Head, BMT Wing addressed the assembled faculty members, staff and doctoral scholars from BMT, Hospital & AMCHSS. Dr Achuthsankar's talk was a journey through the intricacies of research. Beginning from the changing definitions of research and picking through the influence of current technologies in research, Dr Nair navigated through the brilliant yet at times intimidating world of scientific enquiry. His experience & ability to hold the audience in thrall was in evidence through out the lecture. Rocked by laughter & sobered by meditation on rejection from high impact factor journals the talk was well received. The talk was followed by a short audience interaction session that dealt with areas as diverse the social responsibility of a scientific researcher. The SCDSF expressed its gratitude to all who helped make this talk a success.



*Dr Achuthsankar with memento: illustrating a solitary traveler heading in to the horizon, a quiet reference to the solitary search in the sea of knowledge practiced on a day to day basis by PhD scholars.*

### Un-met clinical Needs

**U**n-met clinical needs is an integral part of medical innovation program worldwide. The purpose of medical innovation is to solve everyday clinical problems, with help from experts, which would be beneficial for the clinician as well as for the patient. Medical innovation program may result in a new device or a new standard of care.

Biomedical Technology wing of SCTIMST, which stands for indigenous medical device development, 'Un-met clinical needs' program offered a new dimension and approach to deal with difficulties acutely felt by our clinicians/surgeons on different aspects of medical devices during their daily work. This program had an electrifying emergence from our Senior Residents (SR) Orientation program (OP) which is conducted for several years now, in which SRs were exposed to the research activities of the BMT wing. During September 2011, SROP co-coordinators Dr PR Umashankar and Dr Maya with support of Dr Bhuvaneshwar, the then Head of BMT Wing, introduced 'Un-met clinical needs' wherein the SRs were asked to make brief presentations on their observations on unmet needs towards the end of the orientation program. SRs were called for critical analysis of the un-met needs which they came across during their practice. The BMT wing faculty was taking serious note of individual presentations (a total of 67) in all the four sessions conducted till now. The minute dissection of un-met needs provided wealth of information in teasing out and identifying the splendid problems/ideas faced by our clinicians in daily work.

The next challenge was how to utilize these ideas for product development. Dr CP Sharma, our present Head, BMT Wing, introduced a guideline on assigning projects based on un-met clinical ideas to M.Tech, Clinical Engineering students following the recommendation of a committee and advice of our Director. This guideline covers all the issues such as funding, protection of intellectual property, commercialization etc. In words of Dr Umashankar "***we have reached the 'end of the beginning' and paved the way for the 'beginning of the end'.***" A good foundation has been laid and we can be sure of reaching there when our 'un-met need idea' are translated into a product and hand it over to the clinicians who posed this need.

## Chitra's Stars: Awards/ Honours/ Recognitions

### Nightingale



**M**s Gracyamma Bridget, Senior Staff Nurse joined in SCTIMST on 12-12-1985. At present, she is the infection control Nurse. She achieved post basic BSc degree in nursing in 2001 from IGNOU and certificate in Hospital Infection Control 2007 from SNTD University, Mumbai. She has attended 1 international and 7 national Conferences, and presented paper and poster in national conferences. In the state level continuing nursing education (CNE) programmes, she has also presented papers/ delivered talk on 19 occasions. The Trained Nurses' Association of India, Kerala branch conferred her with "**Best Nurse Award**" for the year 2012. This Award was presented to her by Shri K Babu, Hon'ble Minister for Fisheries, Ports and Excise, Government of Kerala on 3rd November 2012 at Kochi.

### A Timely Act by Crusader

**S**ri Rajendran Nair V, Institute Security Staff, vigilant on duty, swiftly set into action, getting the main lawn cum parking area vacated on one drizzling afternoon in the Sree Chitra Hospital.



The patients, visitors, bystanders hurriedly taken to a safe space under open sky soon realized how a crusader had saved their lives in nick of time. This entire operation was in anticipation of uprooting of a drained tall tree in the campus. Sri Rajendran's timely action and careful assessment of situation averted an imminent disaster in the hospital. Sri Nair is given a Certificate of Appreciation by Director.

### Technical Excellence



**D**r Sureshbabu S joined in Bioceramic laboratory of BMT Wing in 1996. Dr Babu is a native of Thonnakkal (Kerala), renowned as the birth place of great Malayalam poet Sri Kumaran Asan. He received his PhD in Chemistry from University of Kerala (2012) for his work in the area of development of advanced bioceramic coatings on metallic implants. Dr Sureshbabu is a hard working and intelligent scientific officer. He has contributed immensely for the chemical synthesis and characterization of a series of materials developed at the Bioceramic lab. Some of these works have resulted in the development of full fledged technologies which were later transferred to three Indian companies for the commercial production that are sold in various trade names such as Biograft HA new, Grabio Glascera, B Ostin etc. Dr Sureshbabu is co-author to many scientific publications and has more than 6 patents to his credit. He has developed expertise in a number of analytical test methods such as Infrared Spectroscopy (FTIR), X-ray Diffractometry (XRD), Optical Emission Spectroscopy (ICP-OES) and Micro-hardness measurement.

### Field placement at Germany

**Congratulations! All the Best for a fruitful stay at Germany**

Congratulations! Congratulations! Congratulations! Congratulations! Congratulations! Congratulations!  
4 MPH students from 2012 batch and 2 PhD students current batch selected for field placement at University of Bielefeld, Germany



Tintu T James



Dinta Suresh



Suganthi J



Komal Raycha



Tulsi Ram Bhandari



Elezebeth Mathews



# Service Awards: Serving for 1, 2 & 3 decades...





## Events held at SCTMST ....

### Renovated Animal OT Inaugurated at BMT Wing



### World Blood Donor day

World blood donor day is celebrated every year to raise the awareness about the need for regular, voluntary, non-remunerated blood donation and its importance in ensuring that all patients who need blood are able to receive it. The theme for this year is **"Give the gift of Life, Donate Blood"**. The public health students' forum recognized the importance of blood donation in the present scenario where there is a demand for platelets due to escalating number of dengue fever cases in the capital. The function was inaugurated Dr R Sankar Kumar, Medical Superintendent, Dr SK Jawahar, Administrative Medical Officer, and faculty from Achutha Menon Centre for Health Science Studies were also present. Staff members, students as well as volunteers from other institutes also donated blood and actively participated in the programme.



*“Coming together is a beginning; keeping together is progress; working together is success”*

## Independence Day Celebrations



BMT wing Campus

National Flag hoisting

Hospital Campus



## Doctors Day: A Tribute to Doctors!



doctors for their critical role in our lives. Doctor's profession is not just a 'job'; it is a challenging commitment to service that requires high levels of skill and precision. To make a tough job even tougher, doctors also have to deal with the reality that even a small professional mistake could drastically affect a patient's life. Doctors' Day is the perfect time for patients to acknowledge the high-pressured job and appreciate their Doctors' ability to comfort and heal.

First proposal on "Doctors' Day" In India was made by Indian Medical Association, Kidderpore Branch; Calcutta in the year 1989 designating 1<sup>st</sup> July in commemoration of the Birth & Death Anniversary of Eminent Physician and Patriot Dr Bidhan Chandra Roy. "National Doctors' Day" got official recognition in India in the year 1991 by Dept. of Health & Family Welfare, Government of India.

A special tribute is extended to all the Institute Doctors on the "Doctors' Day" on 1<sup>st</sup> July 2013 through Chitra Dhwani. It is a golden opportunity to applaud and congratulate the

## Workshops held .....

### Scientific Writing..

“Workshop on Scientific Writing” organized by SCTIMST, Trivandrum & Kerala State Council for Science Technology and Environment was held on 12<sup>th</sup> and 13<sup>th</sup> June 2013. Resource persons were Prof B Gitanjali, Prof R Raveendran and Dr S Manikandan from the Department of Pharmacology, JIPMER, Pudhucherry. More than 40 students and faculty participated in the National Workshop. Dr Renuka Nair expressed her satisfaction on the success of the workshop, 2<sup>nd</sup> in series (one was held previously on English language skills).



### Mercury Toxicity: A cause of Concern!

“Towards an Environment-friendly healthcare” is an the burning issue on which a consultative seminar and workshop was held on 25<sup>th</sup> May 2013 at the Achuta Menon Center for Health Sciences Studies, SCTIMST, Trivandrum. An insight gained on awareness on mercury toxicity and its proper disposal during the program is described.



Mercury is a common heavy metal used widely in the modern health sector. Health care workers are often exposed to mercury through leaks and breakages of thermometers and sphygmomanometers and also dental amalgams. However, for some it would be shocking to know how toxic this metal, Minamata disease is a live example.

Mercury, also known as quick silver, is a heavy metal which causes immense harm to human health. Mere inhalation of this volatile metal can be toxic since it has the potential to accumulate in the lungs causing chemical pneumonitis. It dissolves in blood and can

also lodge in various organs. Its accumulation in the occipital lobe of the brain causes visual symptoms, and on being swallowed in certain forms it can cause renal shutdown and hemorrhage. The bio-accumulative nature of this metal makes one more prone to the toxic effects. Recent studies have shown that autism (a developmental disorder) too could be caused, to some extent, by the mercury in vaccines.

To avoid toxicity of mercury, some methods that can be employed are:

- Create a mercury elimination task force of key stakeholders in the hospital community.
- Conduct an inventory of equipment, instruments and waste products that contain mercury.
- Train all healthcare staff in the proper disposal of leaked mercury.
- Gradually phase out mercury based thermometers and B.P. apparatuses.
- Use safe, accurate and affordable alternative devices and adopt a mercury-free purchasing policy.
- Use mercury spill kits to handle spills safely.
- Choose a proper site for dumping of the broken mercury-containing instruments to avoid any chance of leakage and contamination of the surrounding environment.
- Conduct a baseline check-up for mercury exposure for all health care workers and monitor their health status bi-annually.

(Contributed by Almas, Joanna and Public Health Students Forum)

## Medico-Techno Club



The first Medico-Techno club of 2013 was organized at the Hospital Wing on last Saturday of June, on 29. The talk by Dr Ganapathy Krishnamurthy from IIT, Chennai was entitled "Semi-automatic Renal segmentation from MR images of Polycystic Kidney Disease Patients". Dr Krishnamurthy's talk was focused on the recent advances in MR imaging for faster diagnosis of kidney disorders. The second talk was on "Haemodynamic imaging of intracranial aneurysms using computational fluid dynamics" delivered by Dr Jayanand Sudhir, Assistant professor from the Neurosurgery department, SCTIMST and Dr Jayabharatha Reddy, VSSC, Trivandrum. The project aimed to derive blood flow simulations in intracranial aneurysms using numerical methods. The talks highlighted deduction of blood flow patterns, turbulence, wall shear stress and other parameters which may prove beneficial in predicting the rupture of intracranial aneurysms.



***“When we long for life without difficulties, remind us that oaks grow strong in contrary winds and diamonds are made under pressure”***

## Upcoming events ....

### Basic Training on 'Ethics in Health Research'

A Short Course for Researchers and Research Administrators will be organized jointly by Achutha Menon Centre for Health Science Studies, SCTIMST & Institute Ethics Committee, SCTIMST. As the emphasis on research in the field of health gains momentum, it is important to realize that research and technology development should be scientifically sound and addresses the needs of people in underprivileged circumstances and enhance equity in access to health care. This course fulfills a felt need for research ethics training among researchers and research administrators in biomedical and public health research.

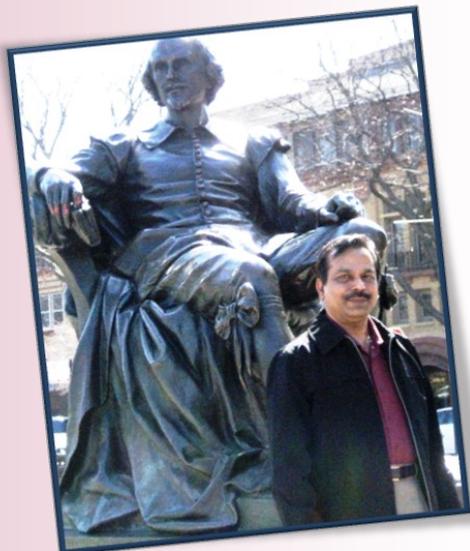
Date: **August 26-27; 29-31, 2013 (5 days)**

**The Organizers:** The Achutha Menon Centre for Health Science Studies has the experience of running a Research one-credit Ethics Module from 2004 as part of its Masters' in Public Health. The Institutional Ethics Committee, SCTIMST is one of the few ethics committees in the country that is registered under the Office of Human Research Protections and obtained a Federal Wide Assurance that has been effective since 2004. It is also registered with the CDSCO, Directorate General of Health Services, Ministry of Health and Family Welfare, Govt. of India (RCNo: ECR/189/Inst/KL/2013). It has a mandate to undertake research ethics training for researchers within the institution.

*Venue:* AMCHSS Seminar Hall, III Floor, AMCHSS Building, SCTIMST

*Contact:* Ms Sreepriya CS  
Exe Secretary to the Director cum IEC  
Coordinator, SCTIMST-IEC  
Director's Office, SCTIMST, spr@sctimst.ac.in,

### The journey of my research life from SCTIMST...



**H**i, let me introduce myself, I am Thomas Chandy recipient of the first PhD degree from SCTIMST. I am really fascinated to narrate the story of why I became a biomaterial scientist, and what I've done since becoming one.

I joined SCTIMST in 1976 as a Junior Research Fellow with Prof Subramonia Iyer, Biochemistry Department, to work on a project "Effect of dietary tubers in the myocardium of rats". Being the first JRF of the Institute, I was asked to meet Prof MS Valiathan, founder Director of the Institute and head of cardiovascular group. I was little nervous about meeting Prof Valiathan for the first time--I was not sure if I would live up to the qualifications that he was looking for in a research fellow. But I was amazed to meet a dynamic young man with specific goals and outlook about the Institute and passion for inventing novel approaches in science and patient care. I thought I am in the right place and was the first step in my life for a research career.

I was fortunate to transfer my field towards research and joined in Biosurface Technology division with Dr Chandra P Sharma, Biomedical Technology wing of the Institute. I learned about Surface energetics, protein/platelet interactions and developed new areas of research in biomaterials, drug delivery. Grad School taught me how to learn and recover from "Failure." I have honored in on these skills such as initiative, more

passion, more drive, more tenacity, more mental toughness, more perseverance and more cogency. It was my bliss when Institute announced the first PhD degree in Biomaterial Science and Technology in 1987 for my thesis "Fibrinogen-Polymer interactions - Influence of plasma components".

After my PhD degree, I received a Scientist position and started my real professional career with Dr CP Sharma himself and managed several external funded projects with him. We published over 60 scientific papers in various international journals. I was fortunate to establish my links and leadership capabilities in Biomaterials area nationally and internationally by serving as Secretary to Society for Biomaterials and Artificial Organs-India (SBAOI). During my 16-year stint at Sree Chitra Tirunal Institute for Medical Sciences and Technology, I could combine biomaterials science, engineering technology, human physiology and technology development in a seamless manner with the help of excellent scientists, engineers and doctors in the Institute.

At present, I work with Hemostasis LLC, St Paul, as a Lead Scientist and Program Director in the new product development group. Prior to joining Hemostasis, I shared my skills with many medical device companies including 3M Pharmaceutical Division (micro-needle transdermal drug delivery), Applied Research group of Boston Scientific Corporation (new product development) and Mechanical Engineering division of Transoma Medical (implantable cardiac monitoring device).

I was always learning in my life and I believe "knowledge is power and creativity and competitiveness is the key to success". Looking at it from some distance now, my path from JRF to Program Director was not that easy. I believe, the world in the 21<sup>st</sup> century is a knowledge based society with multiple opportunities. I like to conclude saying ***"budding researchers - if you nurture the seeds of science with sincere efforts, hard work and love, in your life you can reach the endless sky"***.

Dr Thomas Chandy

***“Memories cannot be sold, cannot be contracted but treasured ”***

## BRAIN DEATH: In focus

### A hard yet destined dialogue with Life!



Death of the physical body is the great certainty of life. According to ancient philosophy, death is only

dissolution of the material body frame. The soul continues to exist and evolve. In its own way, physical science is affirming the validity of laws discovered by the spiritually evolved through the mental science. One of the surest axioms of science is that energy never dies; it can neither be created nor destroyed. According to a new scientific theory by Robert Lanza (Scientist and stem cell researcher) - called *biocentrism*, although individual bodies are destined to self-destruct, the energy within cannot become non-existent.

#### What is brain death?

Death is an irreversible, biological event that consists of permanent cessation of the critical functions of the organism as a whole. Death of the brain therefore qualifies as death, as the brain is essential for integrating critical functions of the body. A patient properly determined to be brain dead is legally and clinically dead. It should not be confused with a persistent vegetative state. Persistent vegetative state is also characterized by unawareness as in coma, but in this state, patients have normal sleep-wake cycles and are arousable. In most adults, trauma and bleeding in brain (subarachnoid hemorrhage) are the most common events leading to brain death. Others include intracerebral hemorrhage, hypoxic ischemic encephalopathy, and ischemic stroke. Any condition causing permanent widespread brain injury can lead to brain death.

#### Necessity to diagnose brain death

As a consequence of developments in critical care, clinicians are faced with the prospect of an apparently 'alive' patient sustained by mechanical ventilation long after brain function had ceased. The confirmation of brain death allows the withdrawal of therapies that can no longer conceivably benefit an individual who has died. In addition, the development of organ transplantation resulted in an associated need to determine death before organ retrieval.

#### Controversies regarding brain death

Controversies regarding brain death include the relationship between brain death and death of the whole person, the international differences in the

nomenclature and criteria for the determination of brain death, and the inextricable links between brain death and organ donation. Whereas some countries (eg, the United States) understand brain death as "whole brain death" others (eg, the United Kingdom) use the concept of brainstem death.

#### Guidelines

Guidelines are available in many countries to standardize national processes for the diagnosis of brain death. Some brain death guidelines specify the qualification and level of experience of those determining death, and most explicitly exclude anyone involved in organ transplantation. The number of doctors required to determine brain death also varies between countries.

#### The diagnosis of brain death

The diagnosis of brain death needs to be rigorous, in order to be certain that the condition is irreversible. The diagnosis of brain death is primarily clinical. Neurologic examination to determine whether a patient is brain dead should proceed only after ruling out reversible or treatable causes of coma; drug intoxication or poisoning; the effect of sedatives or other central nervous system (CNS) depressant drugs; and uraemia or hepatic encephalopathy. Brain death cannot be declared in the setting of hypothermia (<90°F or <32.2°C). The declaration of brain death requires not only a series of careful neurologic tests but also the establishment of the cause of coma, the ascertainment of irreversibility, the resolution of any misleading clinical neurologic signs, the recognition of possible confounding factors, the interpretation of the findings on neuroimaging, and the performance of any confirmatory laboratory tests that are deemed necessary.

#### 1. Loss of Brainstem function:

##### Absent cranial nerve reflexes

Absence of pupillary light reflexes, Corneal reflexes, the oculocephalic reflex (doll's eye response), the oculovestibular reflex (cold water calorics test), Gag reflex and Cough reflex.

##### Negative atropine test

Negative atropine test is the failure of the heart rate to increase by more than 5 beats per minute after 1 to 2 mg of intravenous atropine, proving absence of vagal nerve function.

##### Absent respiratory drive

Absent respiratory drive is essential in the diagnosis of brain death tested using the apnea test.

## 2. Loss of Cortical function

There should be no spontaneous movements and no response to external stimuli (verbal, deep pain).

## 3. Irreversibility

Irreversible brain death is assumed if the cause of brain death is known and accepted to be sufficient to account for death. Identification of historical or physical examination findings that provide a clear etiology of brain death is necessary for the certification of brain death.

## 4. Exclusion of any condition that might confound the clinical diagnosis of brain death

Misdiagnosis of brain death is possible if a locked-in syndrome, hypothermia, or drug intoxication is not recognized.

## Confirmatory Tests

If there is doubt about the diagnosis or if the preconditions for brain stem testing cannot be met then objective tests of cerebral perfusion may be necessary. Indications include:

- no clear cause for coma
- possible drug or metabolic effect
- cranial nerves cannot be adequately tested
- cervical vertebra or cord injury
- cardiovascular instability precludes apnea testing

The clinical examination to determine brain death in children follows the same principles as that in adults. However, many children have hypothermia when they become comatose after a severe brain injury. Several of the cranial-nerve responses are not fully developed in preterm and full-term neonates, and it is difficult to perform a neurologic assessment in an infant who is in an incubator. Because of the limitations on the clinical examination of neonates, an observation period of 48 hours is recommended, as well as a confirmatory test. Confirmatory tests are optional in adults but recommended in children younger than one year old. Electroencephalography is used in many countries and remains one of the most well validated confirmatory tests. Recordings are obtained for at least 30 minutes with a 16- or 18-channel instrument. ***“Love is the bright link between Earth and Heaven. Organ donation is an act of Love transcending grief and pain and fate and death”***

*(Contributed by Dr Rupa Sreedhar, Professor of Anesthesia, SCTIMST)*

***“Death is just life's next big adventure”***

## Opinions

### Public Health Reflections on Chitra Valve

The Sree Chitra valve was instrumental in bringing down cost of heart valve replacement surgeries in India. The need for valve replacement surgeries will continue for a few more decades in India, as rheumatic fever, the disease leading to heart valve lesions, is still around. However, benefits of the Chitra Valve are not reaching to majority of the needy, poor patients, as heart valve replacement surgeries are available only in limited super-specialty hospitals in urban areas. We need to acknowledge this widening unmet need as a design issue!

Changing epidemiology of heart disease in the West has led to a scale down of research in this area. Durability of the prosthetic is not a priority there as most of their patients are adults with non-rheumatic etiology. Their present research focus is on bio-prosthetic valves and polymeric flexible leaflet valves, which would be costlier but safer and more profitable. So we are left to take the lead and reorient our research priorities to develop solutions that suit our health system capabilities and resource limitations.

As our potential beneficiaries are children and young adults, we need more durable and less invasive solutions like trans-catheter valves which could potentially be provided even in our district hospitals. Prolonged use of anticoagulant therapy, needed for these younger patients, also could be made more user-friendly and less doctor dependent. For example, the ambulatory *Thrombo-Check* utility electronically measures the heart valve thicknesses and helps in optimizing anti-coagulant dose for the patient.

We need to adopt co-design principles wherein all potential stakeholders, beneficiaries, providers and policy makers, are involved in the design process. Such participatory and interdisciplinary approaches, building on our frugal innovative capabilities, shall ensure maximal use of the solution. Health Technology Assessment (HTA) tools helps in *a priori* assessment of the economic underpinnings of various technological options and help to prioritize our needs against their costs and scalability. With the richness of our interdisciplinary legacy, Sree Chitra can pioneer this new way of technological innovation to maximize the public health impact of biomedical technologies.

*(Contributed by Dr Biju Soman, Associate Professor at AMCHSS, SCTIMST)*

## Did you know ???

### Snake Venoms: Neurotoxins vs hemotoxins

If you are one who enjoys the nature walk often, an encounter with snakes becomes inevitable. They are found in almost all parts of the world - the tropics, Americas and Australia albeit; only a few species actually pose a threat to humans. However, venomous snakebites claim many lives and cause serious injuries. Species identification is essential for the right antivenom to be administered by the physician; the sooner treated, better are the chances of saving a life.

In India, major venomous snakes include Cobra, Common Krait, Russell's viper and Saw-scaled viper. Cobras usually have a hooded head and when threatened, would rear up spreading their hood. Kraits are conspicuous bluish-black with white bands along its body. The Russell's viper has a distinctive triangular head with bold diamond pattern skin whereas; the Saw-scaled viper is relatively small with large eyes and takes its name from the characteristic dusky serrated scales on its body.

Cobra and Krait venoms are neurotoxic, quickly disengaging the nervous system causing dizziness, nausea and paralysis. Vipers employ hemotoxic venom inducing severe pain and swelling especially at the bite region and as the toxin spreads through the body, victim may feel feverish and nauseas. Subsequent kidney failure and bleeding of gums and tongue may occur. That said, prevention is better than cure. Donning protective foot gear and treading on clear trails the next time you are outdoors can surely prevent being at the receiving end of a pair of venomous fangs.



(Contributed by Soumya Krishnamoorthy, Project Assistant at the Thrombosis Research Unit, BMT wing)

**“Good judgment comes from experience, and experience comes from bad judgment.”**

## Anything other than Science...

### A seed from the tree of life– Coconut!

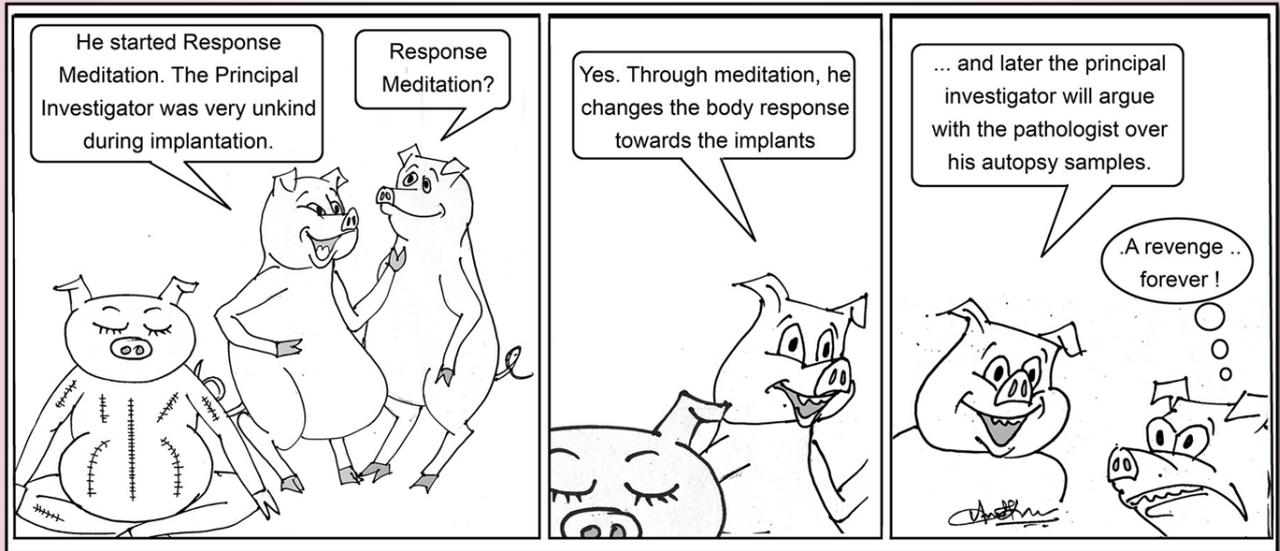
A coconut is the largest known seed in the world. Once a coconut falls from a palm tree, it takes about three years for this seed to take root and sprout into a new tree. The **coconut palm *Cocos nucifera*** is a member of the family **Arecaceae** (palm family). Coconuts are classified as a fibrous one-seeded drupe. The coconut palm is grown throughout the tropical and subtropical area for its many domestic, commercial, and industrial uses; virtually every part of the coconut palm can be used and has significant economic value.

Coconuts' versatility is sometimes noted in its naming. In Sanskrit, it is ***kalpa vriksha*** "the tree which provides all the necessities of life". The various parts of the coconut have a number of culinary uses. The seed provides oil for frying and cooking. The white, fleshy part of the seed, the coconut meat, is used fresh or dried in cooking, especially in confectionaries and desserts. Desiccated coconut (coconut milk) is frequently added to curries and other savory dishes. Coconut flour has also been developed for use in baking, to combat malnutrition. Coconut chips, payasam, salads, chocolates, butter, smoothies, puddings are highly popular dishes made from coconut. Coconut water contains sugar, dietary fiber, proteins, antioxidants, vitamins, and minerals, and provides an isotonic electrolyte balance. Coconut water can be fermented to produce coconut vinegar. It has high nutritional value: 100g of inner edible solid part provides 1480kJ energy and contains 47g of water, 3.33g of protein, 33.3g of fat, with 9g of dietary fibers, vitamin B and C and minerals like calcium, iron etc., while 100ml of coconut water provides 79kJ energy. Other interesting product is coconut toddy. Coconut production in Kerala plays an important role in the state economy and culture of Kerala.

Kerala is actually named after the coconut tree with "**Kera**" meaning Coconut tree and "**Alam**" meaning land so means "Land of Coconut Trees". Coconut oil is also a main ingredient in Ayurvedic oils. The virgin coconut oil reduces total cholesterol, triglycerides, phospholipids, LDL, and VLDL cholesterol levels and increased HDL cholesterol in serum and tissues. The coconut water has estrogen-like characteristics. Coconut is thus a blessing seed in God's own country, with its unique life sustaining qualities.

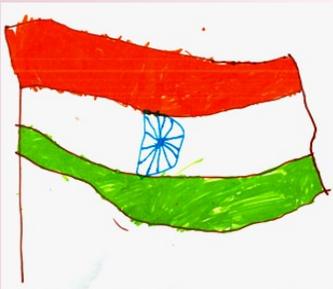
(Contributed by Neelima, PhD student, DTER, BMT wing)

**Fun Page....**



*(Designed by Anil Kumar PR, Scientist C, Tissue Culture Lab, BMT wing)*

**Drawings by children on Independence day**



Abhay Krishna, LKG



Kalyani, Std-II



Malavika, Std-IV



Adrith Kishan, Std-IV

**Four cars bore the brunt of heavy tons of log. SCTIMST put on record deep appreciation to Kerala Fire Force for their prompt response in clearing the lawn and establishing the normalcy in record time.**



## A story.....

### **~~FREEBIRD~~**

Liquor and blood, eau'd slaughter with highlights of ammonia. Sweat dripped off Kutti's brow as he gawped at Baiju quartering the birds. Rajappan, was a machine, necks being cut with something close to a religious fervor. Life bled out of the birds as they undertook a final flight into a large blue bin which shook, as souls dripped out in a final shiver.

Kutti started the de-feathering machine; concentric perforated steel drums started rotating. Each bird was dunked in boiling water set on a kerosene burner, and 20 hurled in to load the machine. Night had slipped by fast; it was 0230 on the clock and morning breezes leaking in through chinks in the walls beckoned to Kutti. He walked out, sank to his haunches, backlit by powerful arc lamps on the perimeter of the farm set up to deter any wayward predator with a taste for poultry.

He lit a beedi, inhaled deeply to keep the "bit" alight, sucking in smoke, dust and the ever present tang of chicken shit. He felt a warm glow; alight to the tips of his fingers, far better than the arrack being doled out behind the shed. He inhaled again, pondering stars in the skies. The real world, let alone a star, felt too far away.

The night was rent suddenly by the loud flapping of wings, cackling noises interspersed with the short barks of tamil expletives. A cage used to ferry birds between life and destiny had broken, cooped up birds had tasted the night & taken a liking to it. Baiju yelled at the men, rousing them from their work induced torpor to retrieve birds. The men started enjoying the action, a welcome diversion from the daily grind. Kutti moved away & sat down on a small ledge watching them as he re-lit his beedi.

His father had brought him here and borrowed five thousand rupees against his labor. His mother had surrendered to T.B. two years ago. The pittance he earned, measured against debt was a mystery to him as all numbers & written words are.

Now the yells were more coherent, a huge yellow light that flickered and danced lit up the yard.

As he ran up to the crowd he saw that the slaughterhouse was on fire. A finger of flame pointed to the sky with dark clouds billowing from its base. Then it hit him, the machine had run dry soon after he left, overheated drums igniting the feathers piled in and around it. The kerosene reserves went up with a soft whoosh, flames devouring nearby hutments.

Kutti shrunk to within himself; for a moment he thought of the aftermath. Running straight to the super's hut he kicked in the door, tugging at the cash register which he found locked.

Taking up an axe from the tool pile in the corner, he split open the register & grabbed a few notes. He ran out to see the super sprinting towards him; the fire had run the drink straight out of him leaving him clear and raging.

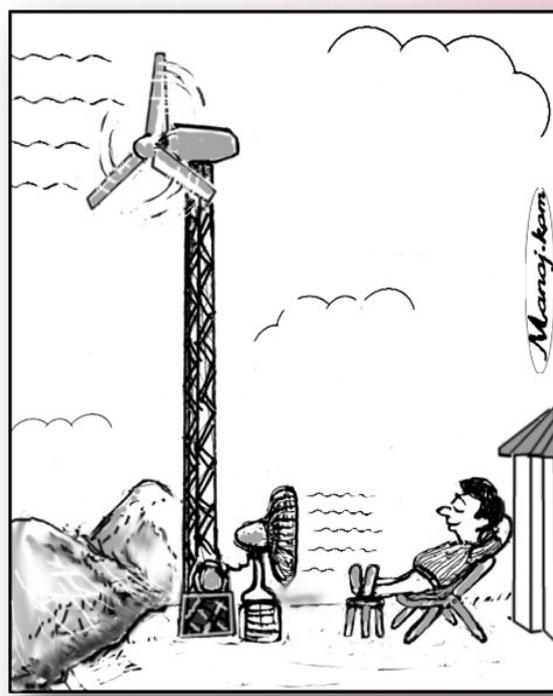
"Da go and help them put out the fire" the super yelled, "I will call the fire force".

"There is no fire force, this place never even had a license"

Blood painted the ground, the earth hungry for life in its eternal cycle drank it in greedily as flames licked at the sky. Kutti ran, to the gate, to the fence & over it to the blacktopped road by the fields. If he was lucky he could flag down a ride on a lorry.

The sun gently touched his cheeks as he lay on the tarpaulin in the cargo bay of a lorry, lulled by the low frequency thrum of the diesel. The tarp had the smell of spices that he had smelled before only when his mother cooked.

*(Contributed by Francis, PhD scholar, and President of Sree Chitra Doctoral Scholars Forum. He dedicates this poem to the muse).*



*(Dr Manoj K has been a professional cartoonist, some 15 years back and has published science cartoons in various periodicals including The Indian Express)*

### ***At the end of a day.....***

The daily toil is done  
Evening is nigh  
Night will follow  
Sweet slumber will gather us to its bosom

What have I done today?  
This day has gone  
Like many before  
Taking with it a reckoning of my deeds

Have I progressed  
In my knowledge?  
In my skills?  
In my relations with my fellows?

Have I managed  
To wipe a tear?  
Still an angry word?  
Keep my little team together?

Have I gone  
To the patient's side  
Studied his illness  
Talked to the doctor and cleared his doubts?

Have I thought  
Of the hallowed halls  
And lofty ideals  
Of the clan that I belong to?

Have I again resolved  
To serve my land  
To serve its people  
And lead with example the coming  
generation?

These are the list of things to do  
I check them  
At end of day  
Heave a sigh, some day I must do better....

**Kavita**

*(Created by Dr Kavita, Professor and HOD of the  
Microbiology Department, SCTIMST)*

### ***Is it done with??***

Inequality spread across the map  
Is beyond scope of bridging the gap  
Between the poor and the richest  
Even when trickle-down heaviest  
Upholds a middle-class biggest  
Out of poor for time briefest

Many a BPL lists tossed about  
By policymakers in time and out  
New poor added as a corollary  
Which neither a pride nor mockery  
On a vast-heritaged nation  
Shaking its own foundation.

Manifold many a political decisions  
None in heed of the poor petitions  
Cast loads of them in distress  
Who in sight or living a marnness  
Daily liven in fear their plight  
With none in their cause to fight.

With no shelter over their heads  
No food, nor water, nor beds  
Count hours day in and out  
With hungry mouths to feed about  
Having neither a penny or shilling  
Many innocent lives a killing.

Can ever the Gini coefficient  
In measure be efficient,  
Or even the Consumer Price Index  
In calculation be prefix,  
To determine severity of poverty  
In India leading to liberty?

Ms Joanna Sara Valson

*Created by Ms Joanna Sara Valson, MPH student in  
batch 2013*



***"The flower that blooms in adversity is the rarest and most beautiful of all."***



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*(The articles are invited for the next issue and may kindly be sent to the above mailbox)*