2015, Vol 3; Issue 4 Sree Chitra Tirunal Institute for Medical Sciences & Technology

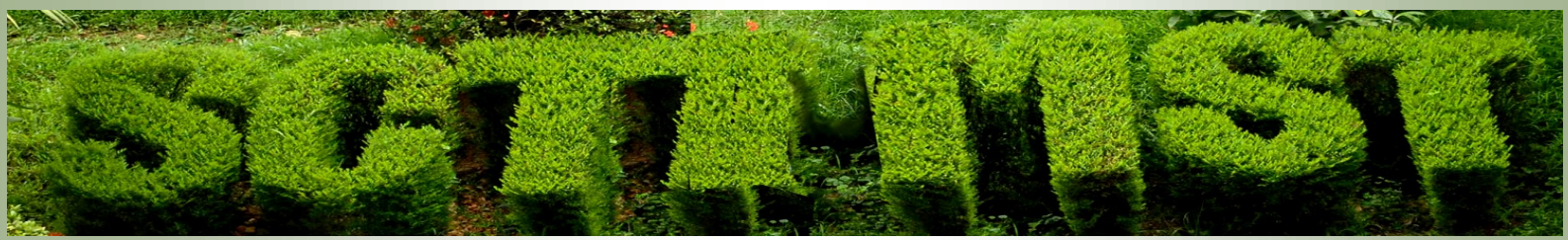
Chitra Dhwani

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

3Tesla MRI

AMCHCS: A Pioneer in Public Health Education in India

www.sctimst.ac.in



Contents

"The NEW YEAR stands before us, like a chapter in a book, waiting to be written. We can help write that story by setting goals & meticulously working on it"

All the previous issues of the Chitra Dhwani can be viewed at the following link:

http://www.sctimst.ac.in/About SCTIMST/Chitra Dhwani/

From Editor....

A Letter from the Editor

Dear All,

It's my pleasure to present the last issue of "**Chitra Dhwani**" in 2015 that marked its successful completion of three years journey. We initiated this magnificent endeavor under the aegis of former Director, Dr K Radhakrishnan in 2013. We were further encouraged by Dr Jagan Mohan Tharakan in all possible ways. We are overwhelmed by the continuous support from Dr Asha Kishore, our present Director with her dynamic, energetic and never ending enthusiastic spirits. The generous co-operation from each and every member of the Chitra family is commendable. With the kind assistance and guidance of all colleagues, far and near, we could meet the challenge of sustaining each issue of the ezine with some novelty and high standards in its content and quality. I express my deep gratitude to everyone for their wonderful support throughout this enjoyable venture.

We are glad to showcase the special feature on "**AMCHCS**" that will provide amazing insight into the outstanding pioneer public health initiatives taken by AMCHCS in the SCTIMST, Kudos to Dr Thankappan for this contribution. SCT also joined the league in forming new Research Council. The radiology and imaging facility is scaling newer heights with the addition of advanced version of **3-T MR machine**. "**A wake up call**" will provide imminent needs of sleep medicine, a superb article shared by Dr V Mohan Kumar, doyen in the area of sleep research.

The active participation of Chitra members in Quizzes and Conferences is noticeable and highly appreciable. The GP Oration by **Dr MS Valiathan**, our beloved lifetime HERO, was scintillating grandeur with outstanding portrayal on GP's life. SCT's participation in various national events is marvelous, whether it is Swatch Bharat Abhiyan, National blood donation day, or Hindi fortnight celebrations. **HEATS series** is truly becoming a never ending successful venture. The **ISPAN-2015** symposium that commemorated the International year of light & Light-based technologies was a grand success. The Nobel prize winners are always a motivational force to youngsters. The **3-D bioprinter** will ride you through a futuristic emerging technology that could print organs. The **'Life and after life'** will definitely find a place in everyone's heart and probably make many of us to start thinking on a way to save life.

We welcome suggestions from you about this endeavor, and continue to look forward to your co-operation and support.

Thanks and best regards

Kamalesh K Gulia
Editor
Scientist & In-Charge
Sleep Disorders Research Lab

Director's Desk: Winds of change...

Dr Asha Kishore, Director, SCTIMST
Professor, Neurology

It is obvious to anyone even leafing through the pages of Chitradhwani, that all the three wings of SCTIMST were beehives of activities in the past few months. Its pictures speak volumes for the efforts of its fraternity and its columns carry the stories of their collective and individual achievements. There has been no pause in the onward march of our people but their new energies are palpable as one turns the pages. From the development of nanoparticles for theranostics to the prevalence of hazardous tobacco use in pregnant women, SCT-ians have proven once again that they have fire in their belly and will religiously continue to contribute to scientific knowledge and gather epidemiological data to make changes in the lives of their countrymen.

A new sense of purpose has gripped the BMT wing and research projects under the new technical research centre initiative are rolling out, after their review and evaluation by the newly formed research council comprising of scientific luminaries from prestigious research institutions. Many new national and international collaborative projects proposed by the Presidents Committee, chaired by Prof MS Valiathan, are taking shape.

SCTIMST-TiMed, the technology business incubator for medical devices and biomaterials, launched less than a year ago, has already attracted half a dozen incubatees working on a wide range of health technologies. Its introduction at the association of Indian medical devices industry meeting to important stakeholders, and its informative and attractive webpage have spread the word of this new initiative and the unique ecosystem.

With the addition of the new 3-Tesla MRI to their armamentarium, our radiologists have more ammunition to conquer the mysteries of the heart and the brain. The research agreement between SCTIMST and GE, opens a new chapter for our young researchers and faculty to script new protocols and programs that will widen the application of this tool.

The Multiple Sclerosis Clinic and Autism Clinic will not only fuel new research but also further the efforts of the department of Neurology to provide state-of-the art treatments, rehabilitation and training to those afflicted by these disabling conditions, as the scope of these services expand in the coming years.

The 3rd GP oration by Prof MS Valiathan was a brilliant narrative of the life and times of the first President of SCTIMST, and a journey through a very significant phase of the history of our institute. The ISPAN-15, the national seminar on health equity and the several workshops and CMEs organized by the faculty of the institute kept the academic environment invigorated and led to dissemination of knowledge beyond our portals.

The accolades and awards pocketed by our people, both young and the not so young, add new sheen to our reputation. My hearty congratulations to all of them. Let their victories inspire others to emulate these achievements. As we open our doors for the winds of change to blow through SCTIMST, it's heartening to see that more of its people have erected windmills and not walls. For, to improve is to change and to perfect, is to change often (W Churchill). As they say, ***change is hard at first, messy in the middle and gorgeous at the end***.

SCTIMST@ facebook..

Sree Chitra recently chose to be on Facebook, one of the most widely connected social networking website. The Facebook Page of Institute is available on the institute webpage

https://www.facebook.com/sctimst.trivandrum

There are 5 different pages: Hospital research, Hospital Services, Academic Activities, Biomedical Research, and Public Health and Research. Each page covers the core activities, collaborative research, startups, new initiatives, videos etc of the institute. The Facebook pages can be browsed without opening one's personal Facebook account; however, to post a message in the Facebook pages, login is necessary. One can write and post a message in a box, which mentions, 'Write something'. Once posted, it is seen in another box, named 'visitor posts', which is displayed on the left-side of the Facebook page.

- **SCTIMST Hospital Research**
- **SCTIMST Hospital Services**
- **SCTIMST Academic Activities**
- **SCTIMST Biomedical Research**
- **SCTIMST Public Health and Research**

Special Feature

AMCHCS: A Pioneer in Public Health Education in India..

Achutha Menon Centre for Health Science Studies: A Pioneer in Public Health Education in India

Recognizing the need for integrating social sciences with health sciences the Governing Body of Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), based on the recommendation of Prof KN Raj (Raj Committee report on Achutha Menon Centre) decided to start the Achutha Menon Centre for Health Science Studies (AMCHSS). The Raj committee recommended three key areas of activities for the centre: research, training and consultancy. Dr Manmohan Singh, the then honorable finance minister of government of India laid the foundation stone of Achutha Menon Centre for Health Science Studies on June 15, 1992.

A small unit for health economics was started within the hospital wing of the Institute to undertake research in health economics and health policy. In January 1997 the first Master Public Health (MPH) program in the country was started in Achutha Menon Centre. In keeping with the spirit of Professor KN Raj report, the MPH program admitted students from medical and non-medical background. Although MPH was not a required qualification for any job positions in India at that time eight students joined for the MPH program.

(The unveiling of a portrait of Sri C Achutha Menon by Dr D Babu Paul in the central foyer of the building of Achutha Menon Centre for Health Science Studies. Prof K R Thankappan, Prof B Ekbal, Prof V Raman Kutty, Dr D Babu Paul, Prof K Radhakrishnan, Prof Suresh Nair, Prof K Mohandas and Prof K P Aravindan (from left to right).

Student research was given a lot of importance in the Centre from the beginning and several student research papers were published in national and international journals. The MPH graduates and the students presented their research work in national and international conferences. The research work of the faculty and students helped AMCHSS to attract international funding for several research grants.

Recognizing the demand and the usefulness of the MPH program many other universities in India started MPH program. Now there are more than 35 institutions in the country offering MPH program. The AMCHSS provided various kinds of support to several of these new institutions. In addition the centre also helped to develop the MPH program in BP Koirala Institute of Health Sciences in Nepal and the MHP program at the Bangladesh Rural Advancement Committee (BRAC), Dhaka, Bangladesh.

AMCHSS was recognized as a centre of excellence for public health training by the Ministry of Health and Family Welfare, Government of India in the year 2000. In the same year, Dr Murali Manohar Joshi, the then Honorable Minister of Science and Technology and Human Resource Development, Government of India dedicated the AMCHSS to the nation.

The Indian council of Medical Research (ICMR) requested our Institute to affiliate their Master of Applied Epidemiology (MAE) program at their national Institute of Epidemiology, Chennai. The Institute agreed to this request and the MAE, which was offered to doctors working with Government health systems in India, was affiliated to SCTIMST from 2001 onwards. Subsequently the MAE program was changed to MPH in Epidemiology and Health Systems. The Institute affiliated the MPH program of Christian Medical College Vellore in the year 2010 and has recently signed an MOU with the Indian Institute of Public Health Delhi of the public health foundation of India to affiliate their MPH Program scheduled to start in mid 2016.

One of the recommendations of the Raj Committee report was to start a PhD program in Public Health after consolidating the masters program. After five years of running the MPH program, the centre started PhD program in public health in 2003.

AMCHCS: A Pioneer in Public Health Education in India..

The centre also started offering a one year diploma in public health (DPH) program in the year 2005 to doctors working in the government health system with at least three years of experience. More than 50 doctors were trained from the state of Gujarat alone. The centre was expected to undertake research in relevant areas of public health in collaboration with various national and international organizations. One of the earliest research projects was on gender sensitization of medical education. Under this project a review of medical text books was undertaken which was published in a special issue of the economic and political weekly of India. This project developed a two weeks duration course on gender mainstreaming in medical education and shorter three day gender sanitization curriculum for medical educators. The shorter version of the course was conducted among medical educators in Karnataka, Gujarat, Goa, Maharashtra and Kerala. Senior faculty members, deans, vice chancellors and policy makers were also sensitized as part of the advocacy initiative.

Another research project was the surveillance of non communicable disease (NCD) risk factors in six sites in India in collaboration with ICMR and the World Health Organization (WHO). The findings of the study were instrumental in including NCD risk factors in the integrated disease surveillance project of the government of India. In another major research project on building capacity for tobacco cessation in India, supported by the National Institutes of Health USA, the centre partnered with five medical colleges (three in Kerala and two in Karnataka) and implemented tobacco cessation modules in these medical colleges. Based on the findings of this study the Kerala Health University and the Rajiv Gandhi University of Health Sciences in Karnataka took initiatives to implement tobacco cessation programs in undergraduate medical education in medical colleges affiliated to these universities. The AMCHSS is now planning to approach the Medical Council of India to formally incorporate tobacco cessation in the undergraduate medical curriculum.

Honorable Chief Minister, Govt. of Kerala inaugurated the World No Tobacco day program on May 31, 2013. Dr AS Pradeepkumar, Additional Director of health services, Sri Janardana Iyer of Regional Cancer Association, Dr K Radhakrishnan (Director, SCTIMST), Dr Paul Sebastian (Director Regional Cancer Centre), Dr KR Thankappan AMCHSS and Sri Saju Itti, Kerala Voluntary Health Services are the others seen along with the Chief Minister.

The research project on the Kerala Diabetes Prevention Program in collaboration with the Melbourne University Australia showed that community based interventions is acceptable and people are willing to participate in diabetes prevention activities. Based on the experience of this project the centre recently received a grant from the World Diabetes Foundation to implement diabetes prevention programs with the support of *Kudumbasree* mission in Kerala in three districts of the state.

The centre collaborated with the All India Institute of Medical Sciences, World Health Organization and the confederation of Indian Industries in the Indian Industrial Surveillance project to reduce the NCD risk factors among industrial workers. The main finding of the study was that work site interventions could reduce NCD risk factors. Based on the findings of this study, the National NCD Control Program included worksite intervention as one of the activities.

The centre conducted a major evaluation program of the national vector borne disease control program in selected seven states of the country and the report was submitted to the Government of India. Being a Government of India Institute and outside the ministry of health and family welfare gives the centre an opportunity for such independent evaluations in the future. One of the recent research projects is on closing the gaps: health equity research initiative in India. Under this project a detailed mapping of health equity research in India has been completed and final reports are available. A national seminar was conducted to finalize the research priorities. A protocol for priority setting areas for healthy equity research in India is under preparation.

AMCHCS: A Pioneer in Public Health Education in India..

The national seminar on Heatlh Equity: Evidence for research in India was inagurated by Shri KM Chandrasekhar, President of SCTIMST and Kerala State planning board Vice Chairman on August 10, 2015. Prof KR Thankappan, Prof Asha Kishore, Prof Daniel Reidpath and Prof TK Sundari Ravindran are gracing the occasion.

AMCHCS centre undertook several consultancies with several international organizations such as World Health Organization, European Commission and World Bank.

AMCHSS has strong collaboration with various national and international public health schools. Under one such collaboration with the Bielefeld University, Germany, two to three MPH Students from AMCHSS spend their two months field placement in Germany which is fully funded by the German Academic Exchange program since 2010. A few PhD students also spend up to three months in the Bielefeld University every year. A few masters students from the German University spent up to four months in AMCHSS as part of this exchange program. In lieu of the financial support for the students from SCTIMST, the German students are waived tuition fee from SCTIMST.

Prof Brian Oldenburg of Monash University Australia and the program Director of the Asian Collaboration for Excellence in non-communicable Diseases (ASCEND) Australia spoke at the international training program for ASCEND trainees on July 29, 2013 at the AMC seminar hall.

AMCHSS has signed MOUs with several Universities in the World such as the University of Arizona, USA, Melbourne University and Monash University Australia, Simon Fraser University Canada.

An MOU was signed between the Monash University Australia and SCTIMST on November 07, 2012. Dr K Radhakrishnan, Director, SCTIMST; Dr KR Thankappan, Professor and Head, AMCHSS and Prof Brian Oldenburg, Monash University Australia are seen.

One MOU between Public Health Foundation of India and SCTIMST was recently signed by Prof Sanjay Zodpey, Director, Indian Institute of Public Health (IIPH-D), Gurgaon and Dr Asha Kishore, Director, SCTIMST, Trivandrum on 28th December 2015.

One of the major challenges for AMCHSS is creating a separate cadre for public health in India. As of now there is only one state in India (Tamil Nadu) which has a public health cadre where public health qualification is mandatory to become a district level health officer and above. Tamil Nadu is reported to have the best health system in India mostly because of this public health cadre. Many other States are planning to create positions for public health graduates. Maharashtra, Gujarat, West Bengal and Orissa have created some positions for public health graduates. **AMCHSS collaboration with the National Institute of Epidemiology, Chennai, Christian Medical College Vellore and the Public Health Foundation of India is an opportunity to work together for creating such a public health cadre in many states in India.**

(Contributed by KR Thankappan, Professor & Head, Achutha Menon Centre for Health Science Studies, SCTIMST, Trivandrum)

> ***"Health can not be a question of income, it is a fundamental human right"***

New Research Council...

SCTIMST convenes 1st meeting of RC..

The SCTIMST constituted a new 12 member Research Council (RC) comprising of highly eminent members to function as a think-tank to provide direction to its researchers and to design a road map to achieve its mission in translational research and medical devices development. The very first meeting of RC was organized by Dr Asha Kishore (Director, SCTIMST) held on 25 Nov 2015, under the esteemed Chairmanship of Prof P Balram (Former Director, Indian Institute of Sciences, Bangalore). The RC undertakes policy intervention to oversee the selection, planning of Institute's R&D Projects and monitor and evaluate its progression, and recommend policies to strengthen the Institute's R&D infrastructure and provide guidance on scientific and technological issues. It is facilitator to provide technical/ scientific knowledge support to the project teams and to enhance networking opportunities with other national/ international institutions.

(*The members of the RC engaged in didactic discussions during evaluation of the submitted proposal presentations*)

SCT gets New Dean...

Prof Kalliyana Krishnan taking charge..

Prof Kalliyana Krishnan V took the charge of Deanship from Prof Suresh Nair on 31-12-2015.

MS Clinic Days

The Multiple Sclerosis Clinic operates at Ground Floor, Block C, Neurology OPD, SCTIMST, Medical College Campus, Thiruvananthapuram, Kerala 695011

Days: Every Tuesday

Time: From 10 AM to 1PM.

New MOUs signed..

SCTIMST & Public Health Foundation of India join hands: Signs MOU

MOU between Public Health Foundation of India and SCTIMST was signed by Prof Sanjay Zodpey, Director, Indian Institute of Public Health (IIPH-D), Gurgaon and Dr Asha Kishore, Director, SCTIMST, Trivandrum on 28th December 2015.

SCTIMST's expanding panorama: Signs New MOUs ...

SCTIMST-TIMed meets AIMED in New Delhi

The SCTIMST-TIMed Technology Business Incubator for medical technologies was introduced to the Indian Medical Device Industry Association (AIMED) and other important stakeholders such as NHSRC, ICMR, DST, DBT, NHHID at a meeting held at India Habitat Centre on 6th Nov 2015. Shri KM Chandrasekhar, President, SCTIMST chaired the meeting. Dr Asha Kishore, Director, SCTIMST spoke about this new initiative and Mr S Balram, CEO, SCTIMST-TIMed gave a presentation on SCTIMST-TIMed. An MOU was signed between TIMed and AIMED.

TIMed
be smart, be a part

TIMed is the Technology Business Incubator for Medical Devices & Biomaterials at SCTIMST

SCTIMST & Osaka City Univ (Japan) sign MOU: Collaboration for academic programs

SCTIMST and Graduate School of Medicine and Faculty of Medicine, Osaka City University, Japan signed MOU to co-ordinate and collaborate in academic activities, research and in teaching programs based upon principles of mutual equality and the reciprocity of benefits.

The MOU between SCTIMST (Trivandrum, India) and Graduate School of Medicine and Faculty of Medicine, Osaka City University (Japan) will be instrumental in realizing students and faculty exchanges, joint research seminars, conferences, workshops, symposia, & combined teaching programs.

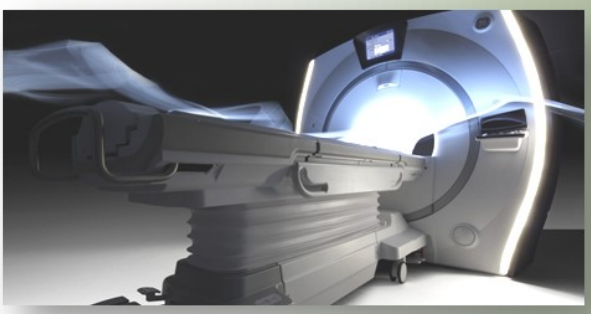
New Facilities...

Multiple Sclerosis (MS) Clinic

(Multiple Sclerosis Clinic was inaugurated by Dr Asha Kishore, Director, SCTIMST in esteemed presence of Dr Jaganmohan Tharakan (Former Director, SCTIMST), Dr MD Nair, Head of Neurology; Dr Sarada C, Med Superintendent and Faculty from Neurology and other departments on 22 Sept 2015

Sree Chitra acquires 3Tesla-MRI machine

Foremost in the Government sector in Kerala



The first three Tesla (3T) MRI (MR 750W) machine in the Government sector in Kerala is installed in the new imaging complex of Sree Chitra Tirunal Institute for Medical Sciences & Technology. This 3T MRI facility along with the new imaging complex was inaugurated by Shri KM Chandrasekhar, President of the Institute, and Vice Chairman of the Kerala Planning Board on 14th December 2015.

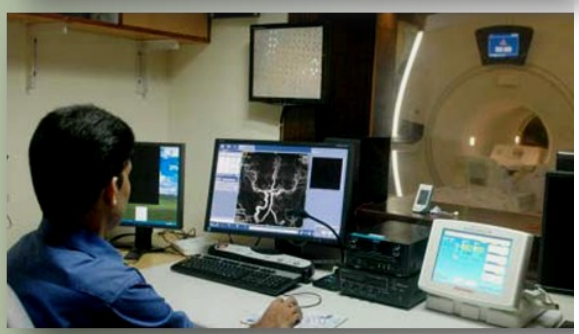
The 3T MRI machine is much superior to the 1.5 T MRI machines that are widely available in the medical colleges & private scan centers in Kerala. The machine is used predominantly for brain, spine & cardiovascular applications and visualizations. Diagnosis & management decisions of various neurological diseases (such as epilepsy, movement disorders, dementia, brain tumor and stroke) and cardiac diseases (such as cardiomyopathy, ischemic heart disease, arrthmogenic right ventricular dysplasias and congenital heart disease) can be made better, by using this technology. The machine also has several new applications for blood flow & angiograms without the use of contrast agents which will be useful in patients in whom these agents are contraindicated (as in renal failure). The scanner has a wider bore which will decrease claustrophobia in patients. In few techniques, the scanner can also run without making troubling background noise. If needed, the patient can watch a video clipping or hear music while the scan is going on. In addition, various post processing tools and software are available which will further facilitate patient care, teaching and research which are the cardinal goals of the institute.

The Institute has signed a research agreement with GE Healthcare for research in the field of MRI.

> ***"Modern medicine uses imaging 'windows' such as magnetic resonance imaging scanners to bring into view otherwise unseen vital information that skilled physicians can use for the benefit of their patients"***

A day at Imaging Sciences & Interventional Radiology ....

Inauguration of New Imaging Complex & New 3T MRI machine at Hospital wing



The department of Imaging Sciences & Interventional Radiology is the backbone for major diagnostic and interventional needs involved in the super-specialized Cardio-Neuroscience Centre of the Institute. Working day and night, the department caters high level imaging services using latest high tech machines for imaging including X-ray machines, 256 Slice CT Scanner (Philips Brilliance 256 slice), Dual Slice CT Scanner (GE), Digital Subtraction Angiography (GE Innova 4100 biplane), Ultrasound system - Philips iU22, PACS (Picture archiving and communication system) - Agfa IMPAX, Radiofrequency Ablation - Celon POWER, Computed and Digital Radiography) - Agfa and Cura, and Magnetic Resonance Imaging (Siements Avanto 1.5T).

The most recent addition is the new 3T clinical cum research MRI system (GE - Discovery 750W) at the new Imaging Complex. SCTIMST is the first Government institution in Kerala to acquire a 3T MR system.

There are also 4 mobile units which are used to take X-rays of patients who cannot be moved to the x-ray unit. Ultrasound scanning facility for all body parts is available at the department. Doppler imaging is carried out for the neck, peripheral arteries , veins and also for the visceral vessels. Transcranial arterial doppler facility is also there in the department. Ultrasound guided interventional procedures performed here include aspiration, biopsies, pseudo-aneurysm occlusion to name a few.

With the state of art CT scanner, the department undertakes all types of CT scans including that of the brain, abdomen, lung, heart and blood vessels.

MR offers a wide range of diagnostic options. This includes routine imaging as also advanced imaging protocols. These include Cardiac MRI, MR angiography, diffusion weighted imaging, perfusion weighted imaging, MR spectroscopy, Diffusion tensor imaging, functional MRI.

According to Dr Kapilamoorthy, Head of the Dept of Imaging Sciences & interventional Radiology, "***this department has one of the most advanced and best infrastructure for imaging and thus cater to all the diagnostic & interventional needs of the institute efficiently***"

Special Column

Sleep Medicine in India: A Wake-Up Call..

Dr V Mohan Kumar *was the former President of Asian Sleep Research Society and Vice President of the World Federation of Sleep Research and Sleep Medicine Societies.*

Let us begin with a quote from William C Dement, the father of modern sleep medicine. **"After all the research I have done on sleep problems over the past four decades, my most significant finding is that, 'ignorance' is the worst sleep disorder of them all. Both doctors and general public know almost nothing about the vast advancement in sleep medicine and sleep physiology"** (Dement and Vaughan, 1999). There are more than 100 identified sleep/wake disorders, affecting about 7-15% of the general population. This high prevalence of sleep/wake disorders is unparalleled by any other disorder that we know of.

Importance of sleep for health and survival is best demonstrated by the disastrous consequences resulting from its deprivation or its repeated interruption. Sleep disorders and chronic sleep loss are risk factors for heart diseases, high blood pressure, stroke and diabetes. 90% of people with sleep problems have one of the above disorders. Those who voluntarily and habitually cut their sleep to five hours a night are at two times higher risk of death, in particular from cardiovascular diseases. Lack of sleep impairs attention, alertness, concentration, reasoning, and problem solving. It makes it more difficult to learn efficiently. Sleep deprivation and sleep disorders can contribute to depression. Sleepiness resulting from previous night's lack of sleep makes one forgetful. Sleepiness may result in grave socioeconomic consequences (e.g. Bhopal and Challenger disasters). A side effect of sleep deprivation is micro sleep (i.e. falling asleep for a few seconds, even without one's own realization). Episodes of micro sleep are extremely dangerous if one is driving. Risk of accident after drinking is magnified several times when one is sleep deprived. Sleepiness causes more motor accidents than drunken driving. Apart from sleep disorders, social, economic and environmental compulsions are the major causes of sleep restriction in society. Lack of sleep can affect our interpretation of events. This hurts our ability to make sound judgments because we may not assess situations accurately and act on them wisely. If sleep deprivation continues long enough, one is at increased risk of hallucinations, and it can trigger mania in people who have manic depression. Other risks of sleep deprivation include impulsive behaviour, depression, paranoia, and suicidal thoughts. Lack of sleep can affect even moral judgments (Killgore et al, 2007).

Sleep health care in India

In India, sleep medicine had a glorious past. Vedas and Upanishads (probably dating back to 3500 BC) have classified the states of consciousness as 1. *Jagratavastha* (Waking phase), 2. *Swapnavastha* (Dream phase), 3. *Susuptavastha* (Sleep phase without dream) and 4. *Samadhiavastha* (Conscious sleep phase). The first three stages have been scientifically described, but modern science is yet to demonstrate electro-physiologically (or through some other technique) the fourth state of consciousness (Kumar 1995; 2015). When we talk about patient care, what comes to our mind is modern medicine, which has a very short history, especially for sleep medicine. But the traditional school of Indian medicine, Ayurveda, considers *Nidra* (sleep) as one of the three supporting sub-pillars of good health. Ayurveda advocates a holistic approach for treating sleep disorders wherein the physical, mental, and spiritual attributes of a patient are emphasized, rather than focusing on the disease, as in conventional modern medicine (Kumar and Gulia, 2015; Gulia et al, 2016). Though the first human polysomnography laboratory in India was established in 1995 at Safdarjung Hospital in New Delhi, sleep was recorded and analysed even during late 1960's and early 1970's, by us at AIIMS-Delhi, on the basis of EEG, EMG and EOG recordings on human subjects and animals, using multi-channel EEG machine and polygraph. Now there are more than 300 laboratories in the country doing polysomnography, though the number of sleep physicians and technologists in this country is highly inadequate (Mallick and Kumar, 2016).

Health insurance is a recent phenomenon in the country and it can be availed of only by the privileged "haves", but it is a distant dream for the large number of "have-nots". Sleep hygiene is the major issue for the poorer section of the society. Their sleeping environment, with insect bites and extreme weather conditions, makes their sleep repeatedly interrupted and extremely uncomfortable. Moreover, India has a large labour-force which works on night shifts, due to power shortage during the day. Power is made available to the factories primarily at night. This also adds to the sleep problems of the underprivileged section of society. Unfortunately most of these unprivileged do not even realize that they have a sleep problem. In fact,

Sleep Medicine in India: A Wake-Up Call..

in our country, most sleep problems are reported by the privileged few only.

Future initiatives

Future initiatives required in our country can be broadly divided into three categories.

1. **Educate and train doctors and paramedics.**
2. **Initiate public awareness programmes (Increase the awareness among teachers, school children, administrators and politicians on the importance of sleep).**
3. **Bringing down the cost of diagnosis and treatment of sleep disorders.**

1. Educate and train doctors and paramedics

Initiatives taken by National Academy of Medical Sciences (NAMS) and Indian Society for Sleep Research (ISSR) to educate and train doctors and paramedics in this country is laudable. A survey conducted by NAMS and AIIMS-Jodhpur showed that sleep medicine practically does not find a place in the medical curriculum in India (Kumar and Bajaj, 2015). There are more than 400 medical colleges in India, excluding dental colleges. A survey conducted by NAMS in 100 participant colleges showed that there is no structured sleep medicine module in any college except one. Even in this college the number of classes taken on sleep physiology and sleep disorders amounted to 2-3 hrs in 4 1/2 years curriculum. Strategies planned by NAMS to meet this challenge include enhancing of educational activities at various levels, e.g. community, general practitioners, medical students and allied health professionals.

The national sleep medicine course launched in India in 2006 by the ISSR, in collaboration with the academic faculty from United States, Japan and India, is the biggest annual teaching platform for sleep medicine in this country. Every year, since 2006, they have been conducting courses in different parts of India, to train 80-100 physicians on sleep medicine. One such course was conducted in Trivandrum, with the participation of SCTIMST faculty and students. The ISSR has been organizing National Sleep Technology Course, every year since 2012, to build a cadre of Polysomnographic Technicians who would provide high quality sleep technology services. The World Sleep Federation (WSF), with logistical support from ISSR, conducts certification examinations in July every year for Indian doctors from 2012. The first Sleep Technician Certification Examination, again with the help of WSF, was conducted in 2015. ISSR has also initiated accreditations of sleep medicine centres and sleep laboratories to ensure and improve patient care.

2. Initiate public awareness programmes

As a major step towards public awareness programme, ISSR had conducted a seminar for school teachers titled "Importance of Sleep for School Children" at New Delhi in 2015. A round table conference was conducted, with invited participation of officials from the ministry of transport and NGOs, on 'Drowsy Driving' in December 2015 at AIIMS-New Delhi. In addition, we have been making use of every available public forum to educate the public, administrators and politicians on the importance of sleep. But a lot more needs to be done in this aspect.

3. Bringing down the cost of diagnosis & treatment of sleep disorders

As the clinician's interest in sleep disorders is growing rapidly in India, the multinational industry is seeing a big business opportunity in this country. With a population of more than 1250 lakhs, people suffering from sleep disorders could be around 125 lakhs. We can assume that there would be a demand for 50 lakhs Continuous Positive Airway Pressure (CPAP) machines (for treatment of obstructive sleep apnoea), and 10 lakh polysomnograph machines (for sleep recording) in the near future. As of today, all these machines are imported. The cost of CPAP machines is Rs 50,000/= upwards, and polysomnograph machines is Rs. 20 lakhs upwards. That means around 4500 thousand billion dollars will go out of the country for purchase of these machines, in the coming years. Even under the best of conditions, none of these machines will work for more than 3 years on an average. Sleep/wake related diagnostic and treatment machines are not restricted to polysomnograph and CPAP. Home sleep test devices, telemetric systems to measure polysomnographic biopotentials, actigraphs, sleep detection system for truck drivers and dental devises for obstructive sleep apnoea are some of the other products which will be in great demand in the days to come. In fact, even the transport authorities in Kerala are toying with the idea of making it mandatory for the truck drivers to wear sleep detection system, during night driving.

Don't we have talented engineers and scientists in this country who could do some research and patent some superior versions of these products and save us from an economic disaster? CPAP is nothing but a modified vacuum cleaner machine. In fact the first CPAP was an inverted vacuum cleaner. Product developers would require extensive support from

A Wake-Up Call..

research oriented sleep specialists during concept formation, development and testing of devices on animals and human subjects. Sleep medicine is a multi-disciplinary specialty, with dedicated pulmonologists as main players. Neurologists, cardiologists, psychiatrists, clinical psychologists, otorhinolaryngologists, dentists, paediatricians, physiologists, biometeorologists and many other specialists are the supporting pillars of this specialty. Sleep research in India has to focus on effects of sleep deprivation on infants, pregnant mothers, and use of traditional Indian medicines, yoga and meditation for sleep disorders.

Sleep specialists and a good sleep research centre are required not only for patient care and product development, but also for many other important national ventures. For example a manned Indian mission to space could take place in a few years. Apart from tackling weightlessness, the space man (or woman) will have to be selected and trained for altered sleep-wake schedule. A specialized sleep recording system would be required for that purpose. This specialized system would be also useful for identifying pilots for intercontinental flights. We cannot continue to adopt ostrichism and put hundreds of innocent lives in danger, only because western nations are yet to implement stringent criteria on this issue for their pilots. *Defense forces will be another major beneficiary of such a facility.*

In 1979, the Surgeon Generals' office in United States created Project Sleep to focus the government's attention on sleep research and sleep disorders. Although the US govt woke up to the call in 1979, we in India in 2016 are still in deep sleep.

References

1. Dement W C and Vaughan C. New York: Delacorte Press. 1999. ISBN *0-385-32008-6.*
2. Gulia KK, Radhakrishnan A, Kumar VM. Part 2, 4th edition, Sleep Disorders Medicine. Edited by S Chokroverty, Springer Science + Business Media, LLC 2016 (in press).
3. Killgore WDS, Killgore DB, Day LM, Li C, Kamimori GH and Balkin TJ (2007). Sleep 30: 345-52.
4. Kumar VM, Gulia KK. Sleep Medicine Reviews (2015), doi: 10.1016/j.smrv.2015.02.006.
5. Kumar VM and Bajaj JS (2015). Ann Natl Acad Med Sci (India), 51(1&2): 39-44.
6. Kumar VM. In Sleep: Ancient and Modern, Edited by Liu Shiyi and S Inoue. Shanghai: The Shanghai Scientific and Technological Literature Publishing House, 1995: p25-33.
7. Kumar VM. In Sleep Medicine, Edited by S Chokroverty, and M Billiard, Chapter 4: DOI 10.1007/978-1-4939-2089-1_4 © Springer Science+Business Media, LLC 2015.
8. Mallick HN, Kumar VM (2016). Sleep Biol Rhythms, DOI 10.1007/s41105-015-0011-0 (in press).

(This special feature is contributed by pioneer Indian sleep scientist Prof V Mohan Kumar, Visiting Professor, SCTIMST)

Our PM calls for 5Es..

The principles of Five Es

Our beloved Prime minister, Shri Narendra Modi ji emphasized that the impact of science will be the most when scientists and technologists will keep the principles of Five Es at the centre of their enquiry and engineering:

Economy: when we find cost effective and efficient solutions

Environment: when our carbon footprint is the lightest and the impact on the ecology is the least possible

Energy: when our prosperity relies less on energy; and the energy we use keeps our skies blue and our earth green.

Empathy: when our efforts are in tune with our culture, circumstances and social challenges.

Equity: when science advances inclusive development and improves the welfare of the weakest.

Tata Trust Big-hearted

Tata Trust donates 3.16 crores to SCTIMST

Tata Trust has made a generous donation of Rs 3.16 crores to the Institute for the purchase of equipment for the Heart Failure-Cardiac Transplant program. The Institute place on record its gratitude to Tata Trusts, **Shri Ramadorai (former CEO, CTS)** and Institute President, **Shri KM Chandrasekhar** for their help.

The Institute also appreciated the efforts of the heart failure-cardiac transplant team, in particular of Dr Harikrishnan, in submitting a worthy proposal to Tata Trusts. The Institute also thanks the Project Cell and Finance Division for their assistance in fulfilling all the administrative requirements

"Gratitude is the healthiest of all human emotions. The more you express gratitude for what you have, the more likely you will have even more to express gratitude for"

Research Highlights....

Fractal Analysis of MR images for differentiating the grades of glioma!

In this study, the research group attempted to differentiate various grades of glioma using fractal dimension and lacunarity and thereby define the dependence of these parameters with increase in malignancy in the different glioma grades. The study focused on the fractal analysis of Fluid Attenuation Inversion Recovery (FLAIR) MR images, for the differentiation of glioma. Intra-tumoral and inter-tumoral heterogeneity are the main features of gliomas which categorize them as fractals.

Fractal analysis is an image processing technique which may be incorporated with routine conventional imaging as well as with advanced MR imaging techniques to give better diagnostic efficiency by incorporating the additional information of grade, in addition to the identification. Since fractal analysis is a tool to analyze the complexity and rotational invariance of an object, it will be helpful to differentiate different grades of glioma using the parameters, fractal dimension and lacunarity. With this additional technique of fractal analysis, the overall sensitivity and discriminative ability of the study is expected to improve. Box counting method with the preprocessing steps namely binarization, dilation and outlining was used to obtain the fractal dimension and lacunarity in glioma. The study observes that fractal dimension and lacunarity increases with increase in the grade of glioma, and lacunarity is helpful in identifying most malignant grades.

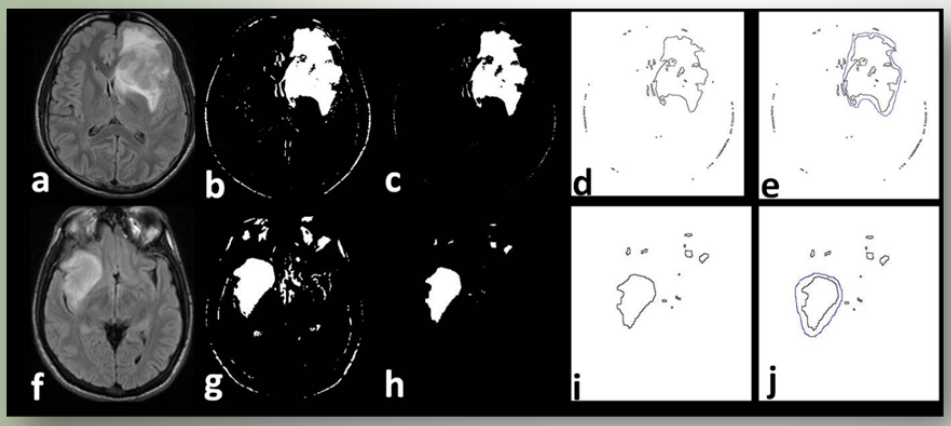


Figure (a-e) represents the original, binarized, dilated, outlined and ROI drawn on the images of high grade glioma and (f-j) low grade glioma. These are pre-requirements for deriving Fractal information.

Ref: *KA Smitha, AK Gupta and RS Jayasree. Fractal analysis: Fractal dimension and lacunarity from MR images for differentiating the grades of glioma,* ***Phys Med Biol*** *2015; 60:6937-47*

Tobacco use during pregnancy in rural Jharkhand, India

The study conducted by public health group of the AMC lead by Dr Thankappan recommended an urgent need to prevent tobacco use among pregnant women in India. They recommended tobacco cessation services during prenatal checkups to those who continue tobacco use during pregnancy.

In this cross-sectional study, 400 women were enrolled who gave birth between June 20, 2011, and June 19, 2012, in the district of Pakur in Jharkhand, using multistage cluster sampling. Information on tobacco use, awareness of associated adverse health effects, and exposure to secondhand smoke was collected by interview. Multiple logistic regression analysis was used to find correlates of tobacco use.

Awareness of the adverse health effects of tobacco during pregnancy was poor in 53.3% women. Tobacco use during pregnancy was significantly associated with an age of 25 years or older and poor awareness of adverse health effects. In this context, this study holds importance in management of tobacco problem during pregnancy.

Ref: *Singh S, Mini GK, Thankappan KR. Tobacco use during pregnancy in rural Jharkhand, India.* ***Int J Gynaecol Obstet.*** *2015; 131: 170-3.*

"Going into a pregnancy is a really challenging time for a woman, because it's forever - changing, both mentally and physically.

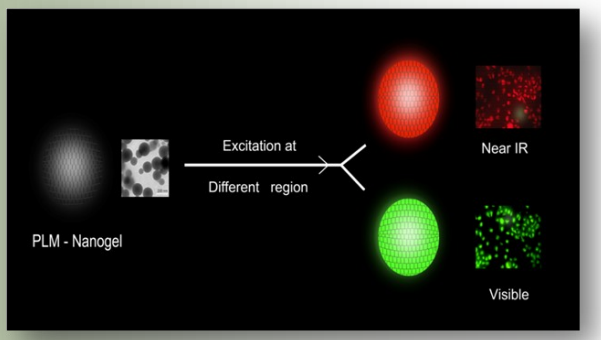
Half a million women die each year around the world in pregnancy. It's not biology that kills them so much as neglect"

Research Highlights....

SCTIMST synthesizes novel polymeric nanogel for biomedical application!

Successful diagnosis of early stage cancer is critical for initiating anti-cancer therapies. Fluorophores having Near IR emission are widely used for imaging cancer. However, most of the currently used Near IR emitting fluorophores have inherent drawbacks such as toxicity, high cost, low sensitivity and non-biodegradability. The development of polymeric nanocarriers with innate Near IR fluorescence capable of performing both diagnostic and therapeutic (theranostic) functions will be beneficial for anticancer applications. Hence development of low cost biocompatible PEG based self-fluorescent polymeric nanogel having innate Near IR emission have potential future implications.

In the current biomedical research scenario, all the reported Near IR emitting polymeric nanogels are based on the conjugation of dyes such as cyanine dyes; Squaraine dyes etc to polymeric nanogels. A self fluorescent near IR emitting polymeric nanogel for bioimaging was never reported. A novel multi-modal biodegradable photoluminescent comacromer [poly (propylene fumarate)-PEG-glycine] (PLM) and near IR emitting self fluorescent hydrogel and nanogel has been developed which is cytocompatible. Cellular imaging of this nanogel on L929 fibroblast and Hela cell lines confirms the cellular imaging capability of this nanogel. To best of our knowledge, this is the first report on a polymeric nanogel with Innate Near IR emissions for bioimaging. More importantly, the facile way of synthesizing fluorescent polymers based on PEG with innate Near IR fluorescence demonstrated in this work can pave a new path for developing biocompatible fluorophores for different bio-medical applications like bioimaging, biosensing and tissue engineering.

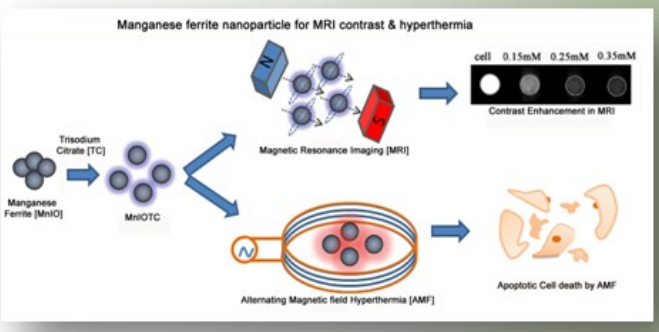


Ref: *Vijayan VM, R Komeri, SP Victor, J Muthu. Photoluminescent PEG based comacromers as excitation dependent fluorophores for biomedical applications* ***Colloids and Surfaces B: Biointerfaces,*** *doi:10.1016/ j.colsurfb.2015.07.027*

Superparamagnetic nanoparticles for theranostics application!

Over the last one decade a series of iron oxide nanopaticles were developed for various biomedical applications by virtue of their magnetic, hyperthermia and MRI contrast properties. Delivery of the dual properties of diagnosis and therapy in a single unit is ideal for optimum use of these particles for individualized treatment, and this mode of treatment, known as *theranostics*, has aimed to revolutionize interventional medical care.

The current work presents development of surface modified manganese-substituted iron oxide (MnIOTC) nanoparticles for theranostic applications. In vitro experiments explicitly showed that MnIOTCs were non-toxic even at higher concentration levels and supported cell proliferation. Effective uptake of nanoparticles by HeLa cells was also established. The heating efficiency of MnIO75TC (the composition in which the concentration of Mn2+is maximal)was evaluated by analyzing the specific loss of power calculation obtained from time–temperature profiles. The in vitro cell death induction ability of magnetic particles via magnetic field hyperthermia was estimated both qualitatively and quantitatively. Contrast efficiency in MRI was also evaluated under in vitro conditions. MnIOTCs possess good biocompatibility and unique magnetic and contrast properties and therefore offer potential in the area of hyperthermia therapy and MRI contrast enhancement for theranostic applications.



Ref: *Beeran AE, Fernandez FB, Nazeer SS, Jayasree RS, John A, Anil S, Vellappally S, Al Kheraif AA, Varma PR. Multifunctional nano manganese ferrite ferrofluid for efficient theranostic application.* ***Colloids Surf B Biointerfaces****. 2015 ;136:1089-97.*

> ***"Put your heart, mind, and soul into even your smallest acts. This is the secret of success"***

Chitra's Stars.....

Quiz Masters from Sree Chitra Triumphs @ 51st State Annual Conference of TNAI!

Mr Rathish Rajan, Staff Nurse, has been awarded First prize in the Quiz Competition at 51st State Annual Conference of Trained Nurses Associations of India on 19.12.2015.

Mr Ridson Delo Luiz, Staff Nurse, has been awarded First prize in the Quiz Competition at 51st State Annual Conference of Trained Nurses Associations of India on 19.12.2015.

Mr Vijayakrishnan R, Staff Nurse, has been awarded First prize in the Quiz Competition at 51st State Annual Conference of Trained Nurses Associations of India on 19.12.2015.

Quiz & Elocution Master

Ms Shani SD, Staff Nurse, has been awarded First prize in Elocution at 36th Annual Conference of Society of Indian Neuroscience Nurses held on 17th – 20th December 2015 at Hyderabad**. Ms Shani** has also won Second prize in Neuro Quiz Competition in this Conference.

Quiz Masters @ CMC, Vellore

Dr Rahul KR, Senior resident, Imaging Sciences and Interventional Radiology, has won first prize in "Lobby Quiz " in the 5th annual conference of Indian association of cardiac imaging held on October 23-24, 2015 at Christian Medical College, Vellore.

Dr Anoop A, Senior resident, Imaging Sciences and Interventional Radiology, has won second prize in Quiz in the 5th annual conference of Indian association of cardiac imaging held on October 23-24, 2015 at Christian Medical College, Vellore.

Congratulations! Congratulations! Congratulations! Congratulations!

Chitra's Stars.....

Joy Doubles with Twin Hits !

Dr Ajay Prasad Hrishi, Final Yr, DM Resident, Anaesthesiology, has won Dr Kop's Specialty Award for the Best Scientific Paper at the 63rd Annual National Conference of Indian Soc of Anesthesiologists held at Jaipur. **Dr Ajay** has also won 3rd prize in the "Poster Presentation" for the poster titled "TEE: A Necenity or Luxury" in Neuroanaesthesia Update held at AIIMS, New Delhi during 26-27 September 2015.

Dr Bharatraj Banavalikar, DM Cardiology, has been Awarded Prize for Oral Presentation in the Annual Conference of Pediatric Cardiac Society of India held from 15th - 18th October 2015. **Dr Bharatraj** is also Awarded First Prize in the Quiz for Postgraduates on Cardiac electrophysiology in The Indian Heart Rhythm Society Annual Conference held on October 30 to November 1, 2015

Dr Srinivasa Prasad BV, DM Cardiology, received "Best Paper Award" in the 5th Annual Conference of the Kerala Heart Rhythm Society held on 19th April 2015 at Kochi. **Dr Srinivasa** has also received "Best Poster Presentation" award during the Annual conference of Interventional Cardiology Council of Kerala held at Kochi during 22-23rd August 2015.

Ms Remya KR, PhD Scholar, Polymer Processing Laboratory, Biomedical Technology Wing, SCTIMST won the Best Oral Presentation Award for the paper entitled "Controlled release of pamidronate from electrospun Polycaprolactone nanofibrous mats for orthopaedic applications", authored by Remya KR and Ramesh P at the National Conference on Biopolymers & Green Composites, BPGC- 2015, organized by Centre for Biopolymer Science & Technology, Kochi during October 9-10, 2015.

Ms Remya KR

Ms Mayuri PV

Ms Mayuri PV & **Remya KR**, PhD Scholars, Polymer Processing Lab, BMT Wing, representing SCTIMST team won the 1st prize in Quiz competition held at BPGC-2015 at Kochi during 9-10 October, 2015.

Congratulations! Congratulations! Congratulations! Congratulations!

Chitra's Stars.....

Dr Aamir Rashid, DM Cardiology received Award for the excellent work done and best abstract presented at the Annual Conference of Indian Heart Rhythm Society 2015 held at Kovalam, Thiruvananthapuram. Dr Rashid also received cash award of Rs one lakh.

Dr Priyadarshini A, DM Cardiology, has been awarded Prize for Oral Presentation in the Annual Conference of Paediatric Cardiac Society of India held from 15th - 18th October 2015 at Hyderabad, Andhra Pradesh.

Dr Gurbhej Singh, DM Cardiology, has been Awarded Young Investigator Award in the Annual Conference of Pediatric Cardiac Society of India, held from 15th - 18th October 2015 at Hyderabad, Andhra Pradesh.

Ms Beena B Pillai, Transplant Co-ordinator, Project #5199 has received Best Paper Award for presenting the paper titled "Experience from the Homograft valve Bank" at the 8th Annual Transplant Coordinators Conference at Chennai during 3-4th October 2015.

Dr Ajay Savlania, MCh, Vascular Surgery of Sree Chitra Institute was awarded First Prize as Best Vascular Trainee in **Rolling Trophy** Competition organized by Vascular Society of India on 3-5 July, 2015 at Goa. The Trophy was presented during Annual Meeting of the VSI during October 2015.

"Action is the foundational key to all success."

Congratulations! Congratulations! Congratulations! Congratulations!

Chitra's Stars.....

Ms Lakshmi V Nair, PhD scholar of BPIL won first prize in the Best Oral Presentation category at the National Seminar on Photonics and its Applications, held at Department of Optoelectronics, University of Kerala during 9 to 11 December, 2015.

Ms Sini S, has won the 2nd prize in oral presentation for paper "Dysfunctional/ proinflammatory high density lipoproteins induce foam cell formation and oxidative stress in monocytes/ macrophages via CD36 through ERK ½ dependent pathway" at National Seminar BIOSPARK held at the MG University, Kottayam during 12 August 2015.

Ms Resmi V Nair, PhD scholar of BPIL won the Best Poster prize at the National Seminar on Photonics and its Applications, held at Department of Optoelectronics, University of Kerala during 9 to 11 December, 2015.

Congratulations!

"A dream doesn't become reality through magic; it takes sweat, determination and hard work"

Dr Suddhadeb Roy, Final Yr, DM Cardiothoracic and Vascular Anesthesia, has won the First prize in the "**Rapid Fire session**" in the 9th National Perioperative TEE Workshop-cum-CME organized by Indian Association of Cardiovascular Thoracic Anaesthesiologists, held at Narayana Institute of Cardiac Sciences, Bangalore during 21-23 August, 2015 for the paper titled "Echocardiographic evaluation of Tricuspid valve".

Dr Arun Gopalakrishnan, DM Cardiology, has won

- the 1st prize in the Intercollegiate Cardiology Quiz held at the 6th Annual Conference of the Indian College of Cardiology – Kerala Chapter.
- the 2nd prize in the Quiz during the CME of Interventional Cardiology Council of Kerala held on 15th February 2015 at Kochi.
- awarded 2nd Prize in the Quiz for Postgraduates on cardiac electrophysiology in the Indian Heart Rhythm Society 7th Annual Conference held on 1 Nov 2015.

Congratulations! Congratulations! Congratulations! Congratulations!

Chitra's Stars...

Chitra's Epilepsy team gets BMJ Award

"**Epilepsy program of SCTIMST**" has won the BMJ award for the "**Medical Team of South Asia,2015**"

Best Paper Awards...

Dr Ashalatha Radhakrishnan, Additional Professor, Neurology Department, received Best Scientific Original Research Paper at the 31th International Epilepsy Congress (IEC) held at Istanbul during 5th - 9th September 2015 for the work Mapping and Volumetry of Heschl's gyrus by VBM aids in planning temporal lobe resection in patients with "TLE with auditory aura".

Dr Bejoy Thomas, Additional Professor, Imaging Sciences & Intervention Radiology has won, First Prize in Poster competition in the 18th Annual Conference of Indian Society of Neuro Radiology held during 08-11 October, 2015 at Indore, India.

Dr Rupa Sreedhar, Professor, Anaesthesiology Department, received Dr Kop's Specialty award for the best paper presented in the 'Cardiac Anaesthesia' section during the 63rd Annual National Conference of Indian Society of Anaesthesiologist held at Jaipur, Rajasthan during 29th December 2015.

Congratulations! Congratulations!

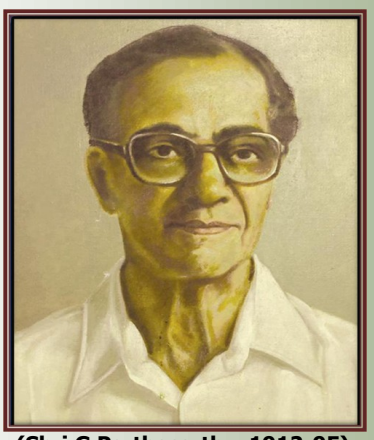
Lifetime Achievement Award..

Prof V Mohan Kumar, SCTIMST, Trivandrum received the APPICON 2008-Lifetime Achievement Award for the year 2015, from the Association of Physiologists & Pharmacologists of India, on 26th November 2015, in recognition of his substantial contribution to the association, during the Annual Conference of the Association held at AIIMS, Jodhpur, Rajasthan.

3rd G Parthasarthy Oration

Prof MS Valiathan delivering 3rd G Parthasarthy Oration on 31 November 2015

Prof MS Valiathan highlighted the life and remarkable political skills of Shri GP during the oration. Shri GP, educated in Madras and Oxford, had served as India's ambassador/ High commissioner in Indonesia, china, United States, and Pakistan. He was a skilled negotiator for India in national and international issues and his role was acknowledged by many leaders including JL Nehru, H Kissinger & Zhou en Lai. He was the Chief Advisor & trouble shooter in policy making for Indira Gandhi.



(Shri G Parthasarthy, 1912-95)

The august gathering was presided by Shri KM Chandrashekhar (President of SCTIMST; Vice Chairman, Kerala State Planning Board). Dr CC Kartha, Prof of Eminence RGCB, introduced Prof MS Valiathan, the Founder Director (SCTIMST) & National Professor. Dr Asha Kishore, Director (SCTIMST) gave the welcome speech. Mr AV Ramani (Former Head, BMT wing), Dr CP Sharma (Former Ag Head, BMT wing) rejoiced attending the oration along with the faculty, students and staff of the Sree Chitra. Mr OS Neelakantan Nair gave vote of thanks on the occasion.

Prof MS Valiathan, National Research Professor, delivering the GP oration at Achutha Menon Centre auditorium, SCTIMST

(Shri KM Chandrasekhar, President, SCTIMST & Vice Chairman, Kerala State Planning Board presenting unique souvenir, a model of the BMT wing Satelmond Palace, to Prof MS Valiathan. Dr Asha Kishore, Director, SCTIMST presenting the GP Oration Certificate to Prof MS Valiathan, our most beloved Founder Director. The magnificent moments captured by Dr CC Kartha, Prof of Eminence, RGCB along with Head, BMT wing, SCTIMST & ALL)

GP Oration was constituted in 2013 to commemorate Shri G Parthasarthi, the 1st President of SCT. Shri GP was a stellar diplomat and brilliant intellectual who made major contribution to education and social science research. The 1st GP oration was delivered by Nobel Laureate Dr Ferid Murad. Prof CNR Rao, National Research Prof, Bharat Ratna delivered the 2nd GP oration.

Cleanathon: SCTians pledge for Swachh Bharat Abhiyan..

National Blood Donation Day, 1 October 2015

Blood Donation Day celebration at SCTIMST

Events held at SCTIMST...Hindi Fortnight Celebrations

Inauguration of Hindi Fortnight Celebration on 14 September 2015

Prize Distribution Ceremony of Hindi Fortnight Celebration

Never ending Ventures: HEATS series 7-13...

Hospital Equipment Awareness Training Series HEATS: Never Ending Venture..

The "HEATS" (Hospital Equipment Awareness Training Series) which was launched by the Division of Clinical Engineering (DCE) on 30th August 2013, is continuing its journey and have crossed more than 12 episodes. The last series was on 12th September 2015 by giving hands on training to Engineers and technicians from various academic Institutions in healthcare and research field on "Anesthesia Machine" at Hotel Vivanta By Taj.

The DCE has initiated this training program with a vision to give hands-on training to ensure the quality and standard of clinical care while using the dedicated and complex equipments. These programs are fine tuned and scheduled in such a way that, proper training is imparted to Doctors, Technicians, Nurses, and Engineers to their expected knowledge level in handling the equipments. Special effort has been put, to ensure that the best possible training faculty available in the country has been chosen for each program.

A list of the latest HEATS series are given below.

HEATS-7	**Hospital Equipment M & M System**
HEATS-8	**Mobile Interventional C-Arm**
HEATS-9	**MRI Hardware**
HEATS-10	**CT- Instrumentation**
HEATS-11	**Basics of Circuit Designing in Electronics**
HEATS-12	**Engineering Principles & Application of MRI**
HEATS-13	**TechAspire**

HEATS-7 titled "**Hospital Equipment Maintenance and Management System**" was conducted on 31st August 2014. The session was directed by Shri Koruthu P Varughese (HOD, DCE) on duties and the responsibilities of a Clinical Engineer in equipment maintenance and management needs with the help of desktop and web applications developed internally in the Hospital. Special training was also provided to all the staffs and trainees on the Equipment Management software programs. The software program includes Item identification, Equipment inventory management, Receipt voucher data entry, tracking of maintenance history, Spare's inventory, EOQ estimation, Issue of work permit and Work order etc. This training was given to support the department staff to enhance their efficiency.

HEATS-8 was on "**Mobile Interventional C-Arm**" conducted on 15th November 2014. This was a one day hands-on training and demonstration program on "Ziehm Vision RFD Mobile Interventional C-ARM", suite installed in Neurosurgery Operation Theater. In neurosurgical spinal procedures, anatomical structures must be displayed with millimeter accuracy. This C-arm delivers high-quality intra operative X-ray images of critical areas and help to achieve easy navigation interfacing. The theory and practical class were taken with the help of experts from BET Medicals PVT Ltd, who is the service provider for this equipment. In addition to the training given to the DCE staff, special dedicated hands on training was provided to a homogeneous group of Doctors, OT Technicians, and Students in their expected level of expertise. A special training was arranged to Nurses and cleaning staff on care, handling and safety use of this equipment.

HEATS-9 was on "**MRI-Hardware"** (22nd December 2014) & **HEATS-10** was on "**CT-Instrumentation**"- conducted on 29th December 2014. DCE joined with IS&IR of the SCTIMST for administering these awareness classes. Staff from IS&IR and DCE attended the class. The classes were very informative and useful to the participants.

HEATS-11 titled "**Basics of Circuit Designing in Electronics**"- was conducted on 10th June 2015. This was one day training on various aspects of electronic circuit designing and its development. This program was organized to create a basic knowledge in Design and development of electronic circuits for biomedical application. The discussion was lead by Sri Sreejith LK of DCE. A detailed discussion was done on Basic electronic components and their design. Semiconductors were also included.

HEATS series 7-13….

HEATS-12 was conducted on 8th August 2015 as a National seminar on "**Engineering principles and Application of MRI**". The news of HEATS has spread out among Institutions and hence there was a lot of demand from outside Institutions to attend our workshop. Giving due weightage to their request, participants were invited from Academic Institutions who are teaching Biomedical Engineering and Research Institutions doing research in the field. Due to our limitations, we are forced to constrain the participants to 100 on first come first basis even though there were more than 260 applicants.

The seminar was inaugurated by Dr Asha Kishore, Director, SCTIMST. It was her first public address to Engineers on a National seminar after becoming the Director. The keynote address was delivered by Dr NR Jagannathan, Professor and Head, Department of NMR, All India Institute of Medical Sciences, New Delhi. He has given an excellent talk on History of MRI in India and about some of his work on MRI. There were 4 theory classes in the morning handled by experts on MRI from M/s Wipro GE on the following topics.

1. **MRI Installation**
2. **Latest Advances in MRI Imaging**
3. **Transition to 3T**
4. **Artifacts in MRI & Mitigation**

In the afternoon, training and demonstration of MRI on the newly installing MRI machine, "**DISCOVERY MR 750W 3.0 T**" was given in two groups of technical and non technical participants. A 30 minutes video on MRI, prepared by the staff of DCE was also shown in the afternoon for both groups. A Quiz competition program was also arranged. The result of the quiz competition was overwhelming and prizes were given for the first and second winners.

HEATS- 13, "TechAspire" was also conducted in an exemplary manner considering the request from biomedical engineers and technicians from outside Institutions on 12th September 2015 at Hotel Vivanta by Taj, Trivandrum. This was a one day program. Hands on training on the different models of Ventilators and Anesthesia Machines maintained by M/s Wipro GE were given in addition to the theory class on the technical aspects of the machines. There were more than 100 participants. The feed back of the workshop was encouraging. The DCE is receiving enquiries from many people to organize similar program repeatedly**.**

(Contributed by Koruthu P Varughese, Engineer G & Acting HOD, DCE, SCTIMST, Trivandrum)

SCTIMST organized ISPAN 2015…

SCTIMST commemorates the International Year of Light and Light-based Technologies
International Symposium on Photonics Applications and Nanomaterials: ISPAN-2015

Dr Asha Kishore (Director, SCTIMST), Shri KM Chandrasekhar (President, SCTIMST), Shri Justice P Sathasivam (Governor, Kerala) & Prof MS Valiathan during ISPAN proceedings (Top to bottom)

ISPAN-2015 was inaugurated by Hon'ble Governor of Kerala State, Shri Justice P Sathasivam. Institute President Shri KM Chandrasekhar presided over the inaugural function. Dr Asha Kishore, Director, SCTIMST and Dr A Ajayaghosh, Director, NIIST, Trivandrum gave the felicitation addresses. Prof MS Valiathan delivered the inaugural lecture. This three day symposium was organized by Dr Jayasree. Symposium was attended by pioneers in the field of photonics & Nanomaterials including the international faculties Prof K Ariga (Japan), Prof S Achilefu (USA), Prof BR Cho (Korea), Prof R Bhargawa (USA), Prof D McNaughton (Australia) Prof V Biju (Japan), Prof D Bonifazi (Belgium), Prof Y Negishi (Japan), Prof GD Sockalingum (France) and Prof DM Helene (France). The national speakers from institutes from all over the country includes Prof G Thomas (IISER), Prof A Jayakrishnan (IITM), Prof T Pal (IITM), Prof PK Gupta (RRCAT), and Prof KV Ramanathan (IISC). The symposium was well attended by the student community and young researchers from country.

Events held at SCTIMST...

Stroke CME 2015




Talks by International Faculty on Stroke Care & Rehabilitation








(Prof Richard Lindley (Australia) gave lecture on Acute stroke care & thrombolysis; Prof Anne foster (UK) deliberated on advances in Stroke rehabilitation on 1 Dec, 2015.)

Events held at SCTIMST...

Back to Basics: Short course on Basics of Cardiac Interventions (19-20 December, 2015)

"It's impossible, said pride.....It's risky, said experience.....
It's pointless, said reason.....Give it a try, Whispered the Heart"

Workshops held at SCTIMST…

Workshop on article writing for Medical Microbiologist (17-18 September, 2015)

Hands-on statistical tool "R": Analyzing Medical & Health Data @ AMCHS

"Writing means sharing. It's part of the human condition to want to share things - thoughts, ideas, opinions"

Events held at SCTIMST...

Unmet Needs: Presentation of Medical Device Proposals to Presidents Committee

India International Science Festival at IIT, New Delhi (4-8 December, 2015)

(DST Secretary Prof Ashutosh Sharma and Dr Praveer Asthana, Adviser DST visiting exhibition stall of SCTIMST at India International Science festival at IIT, Delhi. Er Vinod kumar (Sc E) and Dr Sachin J Shinoy (Sc E) represented the Institute.

Events held at SCTIMST...

Seminar for Young Researchers Organized by MRSI Trivandrum Chapter





The Technical Seminar on Young Researchers was organized by Materials Research Society of India, Trivandrum Chapter on 31 December, 2015 in BMT Wing, SCTIMST, Trivandrum. Shri OS Neelakantan Nair Inaugurated the Seminar which was followed by the technical session. Dr M Jayabalan, Chairman, MRSI, Trivandrum Chapter welcomed the gathering. Dr RS Jayasree, Convenor, introduced the speakers and chaired the sessions. Five technical lectures were delivered by young faculties from various institutes. Dr Subodh G (Asst Professor, Kerala University) delivered a lecture on "White Light Emission Through Single Phase Host Materials". Dr Vijayakumar C Nair (Scientist & Ramanujan Fellow, NIIST) talked on "Hybrid Perovskite Materials: Beyond Solar Cells". Dr Shivaram Selvam (Scientist D & INSPIRE Faculty Fellow, SCTIMST) gave a talk on "Click Reactions: Polymeric Material Synthesis and Their Biomedical Applications". Dr Raj Sankar Cheriyedath (Scientist Fellow, NIIST) lectured on "Quantum superparamagnetism in nano-magnets" and Dr Shiny Velayudhan (Principal Investigator, BioCare, SCTIMST) gave an outline on "Bioprinting: An approach for printing tissues and organs".

"Research indicates that employees have three prime needs: Interesting work, recognition for doing a good job, and being let in on things that are going on in the Co./Institution"

Interaction with Experts…

Dr Hanumanthu Purushotham
Chairman and Managing Director
National Research Development Corporation
(NRDC), New Delhi

Dr Hanumanthu Purushotham's visit in the Biomedical Technology wing was one of the most cherished one for the faculty and staff in today's era of new starts up, incubators and device development.

Prior to the current assignment, Dr Purushotham was Scientist-G & Head of Knowledge Management Centre of International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), Dept of Science & Technology, Government of India, located at Hyderabad. He has about 30 years of diverse experience across the innovation value chain in different industry verticals in R&D, technology business incubation, technology marketing, techno economic feasibility analysis, IPR's management, technology transfer & commercialization, project appraisal, project finance, knowledge management and business development. He worked at different government institutions of repute including Technology Development Board of DST, National Institute for Smart Government/Department of Information Technology, New Delhi.

Dr Purushotham discussing the nuts and bolts of new technology development with faculty member of BMT wing, SCTIMST

Excerpts: Dean's Message..

My mind is filled with beautiful memories, a sense of gratitude and fulfillment are the lovely expressions of Dr Suresh Nair on the eve of the New Year 2016 when he handed over the charge of the Deanship. Dr Nair expressed that the last 3 years has been a fabulous experience of mentoring young minds achieve their academic goals and scale greater heights. Remembering the words of the French philosopher, Nobel laureate Albert Camus ***"When you have exhausted an experience, you turn back, revere and love it"*** , Dr Nair summed up the enriching time he experienced as the Dean of Sree Chitra Tirunal Institute from 2013-2015. For him, the academic section was akin to an orchestra wherein, though the dean may be the choir master, many others contribute in their own special way to the rapturous melody.

He cherished the enchanting memories of the academic festivities, the convocations, the orations, the entrance tests, the interviews and the committee meetings that brought out the best from the academic elite. He relished each and every moment of these activities that made him grow in scientific wisdom and administrative experience.

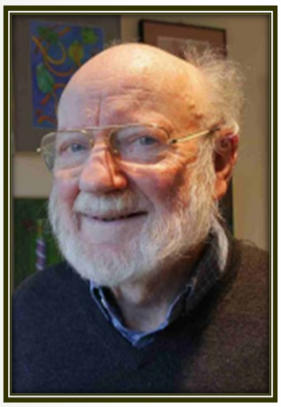
He profusely thanked every special people who contributed immensely in guiding him and helping him through the responsibilities of the deanship. He had all words of praise for Prof Jaganmohan Tharakan (Former Director) and Prof Asha Kishore (Director). He specially remembered Dr Renuka Nair for helping him in various endeavors. His heart filled with gratitude to all the colleagues in the academic division who made the process of the "administration of education" so exciting and a wonderful team job. He profusely thanked all the faculty, scientists from all the depts, the resident Drs, students for filing his deanship experience with memorable moments. He made a special mention of his colleagues & residents from the Neurosurgery dept for holding the fort strongly when he went about the daily deanship chores. "***My days as the dean have given me a unique sense of joy, peace and purpose. New courses that were the need of the hour, difficult but humanistic administrative decisions, trying to help resident doctors with life's little 'ups and downs', all have made me happier and fulfilled***". Dr Nair conveyed best wishes to Dr Kalliyana Krishnan, the new Dean of SCTIMST. Dr Nair presented beautiful quote:

"The future belongs to those who believe in the beauty of their dreams"

Nobel Prize 2015....

Medicine/ Physiology

The Nobel Prize in Physiology or Medicine was awarded to three scientists William C Campbell, Satoshi Ōmura and Youyou Tu. William C Campbell and Satoshi Ōmura jointly won half of the Nobel Prize for their discovery on Avermectin, a novel drug therapy against number of diseases which includes River blindness and Lymphatic filariasis. Youyou Tu was awarded the other half of the prize for discovering Artemisinin, a drug therapy against malaria.



William C Campbell
Drew Univ, Madison
Irish, American
85 Yrs

Satoshi Ōmura
Kitasato Univ, Tokyo
Japanese
80 Yrs

Youyou Tu
CATCM, Beijing
Chinese
85 Yrs

Physics

Takaaki Kajita
Univ of Tokyo
Japanese
56 Yrs

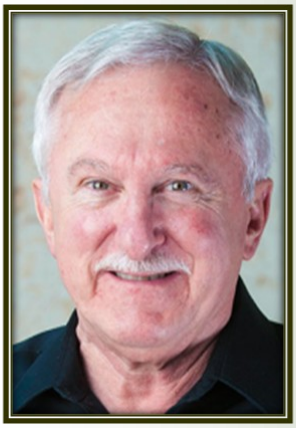
Arthur B McDonald
Queen's Univ
Canadian
72 Yrs

The Nobel Prize in Physics was awarded jointly to Takaaki Kajita and Arthur B McDonald "for the discovery of neutrino oscillations, which shows that neutrinos have mass". Takaaki Kajita and Arthur B McDonald were key scientists of two large research groups, Super-Kamiokande in Japan and Sudbury Neutrino Observatory in Canada, which discovered the neutrinos mid-flight metamorphosis. They discovered a new phenomenon – neutrino oscillations. A far-reaching conclusion of their experiments is that the neutrino, for a long time considered to be mass less, must have some mass. They solved the neutrino puzzle and opened a new realm in particle physics.

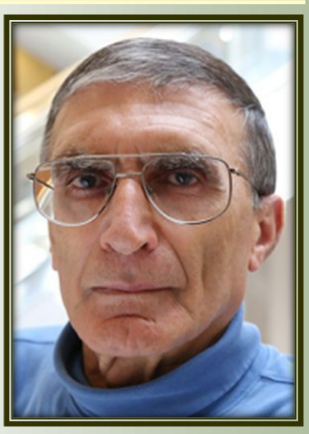
Chemistry

The Nobel Prize in Chemistry was awarded jointly to Tomas Lindahl, Paul Modrich and Aziz Sancar "for mechanistic studies of DNA repair". They were awarded for having mapped, at a molecular level, how cells repair damaged DNA and safeguard the genetic information. They studied in detail molecular mechanisms involved in base excision repair and mismatch repair etc.

Tomas Lindahl
Clare Hall Lab, UK
Swedish, British
77 Yrs



Paul Modrich
HHMI, Durham
American
69 Yrs



Aziz Sancar
Univ North Carolina
Turkish, American
69 Yrs

As per the will of the Swedish inventor Alfred Nobel, Nobel prizes were established in 1895. Since 1901 the prizes in Chemistry, Literature, Peace, Physics, and Physiology or Medicine were awarded. The prizes are traditionally presented to the winners in a ceremony in Stockholm, Sweden, on December 10, except for the peace prize which is awarded in Oslo, Norway usually on the same day. The award includes a Diploma, Medal and Eight million Swedish Kronor (INR 6.3 Crores) per full Nobel Prize, which is shared among winners.

Compiled by Dr Praveen KS, Ramanujan Faculty Fellow

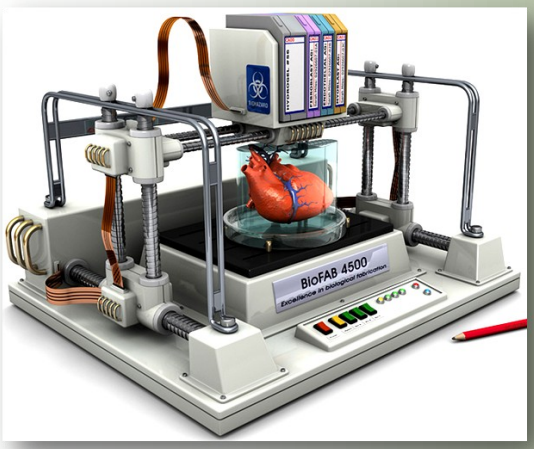
3D Bioprinting: Organ printing on cards!

Bioprinting of functional three-dimensional (3D) tissues is a rapidly emerging technology in the areas of tissue engineering and regenerative medicine. 3D bioprinting involves the use of biocompatible materials, living cells and a slew of growth and differentiation factors to form functional 3D living tissues. In this methodology, cells, biomaterials or cell-laden biomaterials are printed layer-by layer onto a bioactive support surface with precise positioning and spatial control to create desired 3D cellular structures.

By far, various human tissue constructs from skin, bone, liver, heart, blood vessels, and cartilaginous structures, have been successfully bioprinted for numerous biomedical applications. These primarily include use as tissue models in pharmaceutical research to improve disease modeling and aid drug discovery and development or for clinical transplantation to repair or replace failing tissues. The latter will have huge impact in the healthcare sector as it addresses the twin problems of chronic human transplant organ shortages and rejection of transplanted organs. Using this revolutionary technology, cells from the patient's own body can be isolated, expanded and used to print 3D tissue-like constructs to fill the geometry of the tissue/organ defect site.

For 3D tissue bioprinting, cells are typically expanded to large numbers in a bioreactor culture system and are mixed with a scaffold material whose selection depends on the cell-type being used for organ printing. The biomaterial scaffold serves as a logistic template for cells by providing structural, topographical and biochemical cues conducive for tissue formation. The cell-laden semi-solid biomaterial, termed as '**bio-ink**', is then loaded in cell cartridges and printed using an extrusion process in an inkjet-based or laser-assisted bioprinter to create defined 3D tissue-engineered constructs.

Tissue	Organ
A tissue is composed of group of similar cells that carry out a specific function. Examples: muscles, veins, connective tissue, ligaments etc	**An organ is composed of multiple tissue types to form a structural unit that serve a common function. Examples: Heart, lung, liver, kidney etc**



Schematic of a 3D bioprinter that could print whole organs for human transplantation in the future.

Recent advances in this area have also led to the development of scaffold-free 'self-assembly' approaches wherein aggregated cells without the use of exogenous biomaterial are used as printable mini-tissue building blocks. The post-printing fusion of the cellular building blocks creates more physiologically relevant tissue architectures as the printed cells are in direct contact with each other ensuring transmission of vital molecular signals, secrete their own extracellular matrix components, and recapitulate normal developmental processes favorable for tissue regeneration. In this way, a fully maturated 3D bioengineered construct is fabricated which is anatomically and functionally close to a native tissue.

Despite the tremendous progress and notable outcomes, 3D cell bioprinting poses serious challenges for successful clinical translation and commercialization. For instance, 3D bioprinting is limited to small one or two-cell type tissue structures as fabrication of large tissue constructs are limited by diffusional penetration depth of oxygen and nutrients, which can permeate to only ~ 0.1 mm of viable tissue. Although modest advancements have been made to promote oxygenation and nutrient supply to cells by using micro-channeled scaffolds or pre-vascularized fabricated tissues, bioengineered constructs require innervations for proper physiological functioning and biointegration with native host tissues *in vivo*.

In spite of this paramount need, regeneration of nerve fibers is not adequately addressed as it is technically more demanding compared to vascular regeneration. Also, complex multicellular bioengineered tissue architectures are currently not

In Focus 3D Bioprinting...

feasible due to the sheer volume of cells needed to bioprint solid organ structures. Furthermore, this technology is cost-prohibitive and is associated with very low throughput as a single instrument printing single cells at a frequency of 10 kHz averages more than a day to bioprint 1 cm^3 of living tissue. Nevertheless, this emerging technology dawns a new era in patient healthcare that will lead to path-breaking approaches towards personalized regenerative medicine. **Much of the future of 3D organ printing will depend on solving the fundamental complexities related to classical tissue engineering methodologies and the successful integration of technologies from the variegated disciplines of engineering, biomaterials science, cell biology, and medicine.**

A few examples of 3D-printed tissues

Bioprinted liver tissue
Pandorum Technologies Pvt Ltd
Bangaluru, India

Replacement ears
Wake Forest University
North Carolina, USA

Flexible skin like material
University of Toronto
Canada

3D printed heart valve
Cornell University
USA

Tracheal scaffold
University of Michigan
USA

(Contributed by Dr Shivaram Selvam, Sc-D & INSPIRE Faculty Fellow, Polymer Division, BMT Wing, SCTIMST)

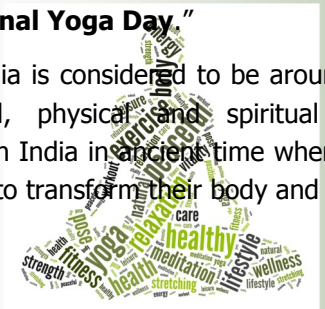
Did you know ???

Yoga, an ancient Indian heritage!

Commemorative stamp released by INDIA POST

Commemorative Coins released on International Day of Yoga 2015

World Yoga Day or International Day of Yoga on 21st of June every year was declared by the United Nations General Assembly on 11th of December in 2014. The declaration was done after the call by the Indian Prime Minister, Narendra Modi to the United Nations General Assembly on 27th of September in 2014 during his address to the UN General Assembly. Narendra Modi has said during his address to the UN General Assembly that "**Yoga is an invaluable gift of India's ancient tradition. It embodies unity of mind and body; thought and action; restraint and fulfillment; harmony between man and nature; a holistic approach to health and well-being. It is not about exercise but to discover the sense of oneness with yourself, the world and the nature. By changing our lifestyle and creating consciousness, it can help us deal with climate change. Let us work towards adopting an International Yoga Day.**"



Yoga in India is considered to be around 5,000 year old mental, physical and spiritual practice. It originated in India in ancient time when people used meditation to transform their body and mind.

QUIZ 9

What is 'Startup India ?

Please send your entries with Name and Department address to mailbox:
enewsletter@sctimst.ac.in

The winners (five) will be announced in next issue of Chitra Dhwani.

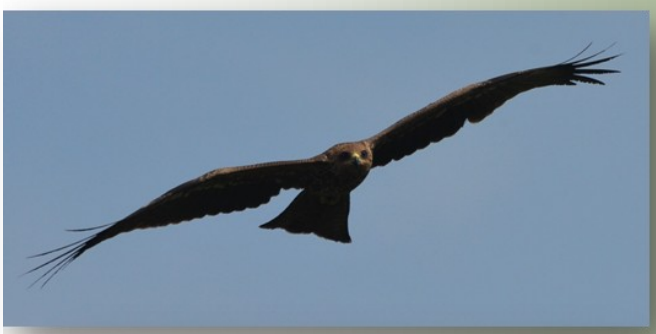
Camera captures!

'Following the light of sun, we left the old world ' by Arathi R, SDRL, BMT wing, SCTIMST

KodaiKanal view captured by Ramaprasad V, Stores & Purchase Div, BMT Wing, SCTIMST

Rays of hope by Dr Kamalesh K Gulia, SDRL, BMT wing SCTIMST

Christmas special Visitor: by Arumugham V, Calibration Cell, BMT wing, SCTIMST



Glimpses from campus by Dr Sachin J Shenoy, Div of In-Vivo Models & Testing, BMT wing, SCTIMST

Real life Story Life and after life!

If you ask any wise man on this planet about life after death, the answer would not be a straight one. No one from medical science too can answer that question as it remains in the realm of mystery. However, death in many ways does not end the story of life as I learnt from a patient's family some years ago.

It was a weekend and being a holiday, there was a lull at the hospital at Trivandrum where I was serving as a member of the Neurosurgical team. The Out Patient Clinics were not packed unlike other days of the week and the Operating Rooms witnessed less hectic action. I was at my OP Clinic when a distraught family walked in with a medical report. I scanned through the reports and found out that Mrs Seethalekshmi, resident of the Fort area of Trivandrum, the patient in question had suffered a devastating stroke and was admitted elsewhere in another hospital in the city. It was just another day at work for her as she prepared sweets and other food items in her home and sold them to their patrons (who regularly praised her copiously) when tragedy struck. Her children wanted to know if any treatment was available at our institution to cure their mother.

The medical report and the CT images of the patient's brain revealed a grim picture. A hitherto healthy lady had suffered severe headache followed by loss of consciousness. Currently, she was on life support with a ventilator giving her the much-needed breaths that sustained her life. The CT images confirmed my worst fears - a massive hemorrhage that had shut down her brain forever. Now, it was my turn to give her family the bad news that she is not going to wake up from this state of coma having suffered irreversible damage to the brain resulting in what is called 'brain-death'. If there is something about the practice of medicine that I detested, it is such moments when you shatter the hopes and lives of patients' families as you reveal to them that their dear one is not going to make a comeback to life.

Mrs S's children heard my pronouncement and as was expected, broke into tears. I sat passively in a state of utter helplessness as I had conceded the match with a much superior force of nature called fate. A few minutes passed as I got up and turned towards the eldest member of the family and asked "Can you consider donating her organs"? I was not expecting a favorable reply as the family has not yet reconciled to the verdict that was delivered earlier by

me. All of them got up and left my room obviously to discuss the option thrown at them.

I braced myself to a 'no' as I was not expecting them to give in to my request. Those were early days when organ donation from brain-dead patients had still not caught the imagination of the general public in our part of the world. Also I had my own prejudice that this family would not allow their mother to die with what many people falsely believe to be an imperfection ie without their liver and kidneys. I was in for a shock as the family came back and said- "*Doctor, please do the needful: if our mother's organs can help someone to live there is no greater satisfaction for us than that*".

It kicked off a frenetic series of actions that lasted for the next forty eight hours. One team comprising of physicians nominated by the Government of Kerala made the legally mandatory "certification of brain-death" in this patient over the next seven hours by a series of neurological examinations. Another team of intensivists made sure Mrs S's organs worked well on ventilator as she was prepared for the harvest- procedure of her organs. Also infections and cancers, which bars one from donating one's organs too were ruled out. Multiple teams started working at the same time across the state.

The surgery on Mrs S to harvest her liver and kidneys began by midnight. At a hospital in Kochi, a patient was rushed to the operating room to remove his diseased liver and receive the donor's organ. Another team in Calicut worked on two persons who matched Mrs S's blood group and tissue specifications. They had their abdomens opened for receiving her kidneys. The ambulance drivers sacrificed their sleep and made their dash towards Cochin and Calicut from Trivandrum as the police department worked those extra hours to keep the roads open so that the organs may be transported without delays by road blocks to their waiting recipients. The coordination required to keep this all in place was mind- boggling but just fell in place as many teams worked in tandem to achieve a few medical miracles.

Life and after life!

It was at least two days later that I got to catch up on my sleep deficit incurred at work but then I was woken up by my phone's ring. I was feeling a little irritated as my sleep was interrupted. It was my colleague from Calicut who was taking care of the patients who received Mrs S's kidneys. He uttered two words - "Urine passed" - signaling that the recipients' on whom the kidneys have been transplanted showed signs of integration with the host's body. My irritation at my sleep being interrupted vanished and a smile played on my lips as a sense of contentment washed over me. By noon I got another call from the transplant team at Kochi that the transplanted liver too had started functioning well.

At this point, you may ask me if there is life after death. My answer would be simple. Death is an inevitable eventuality. Every death is a tragedy, something that leaves a trail of sorrow. But then giving life to others around us as we lose ours is truly a noble act to cheat death itself.

Donating our organs at the end of our lives is the most sacred act of life. This way there is always - life and after-life.

(Dr Easwer HV (Additional Professor, Department of Neurosurgery, SCTIMST, Trivandrum) contributed this amazing real life story that gave life to a few)

Up to 25 different organs and tissues can be donated for transplantation. Transplantable organs: Heart, kidneys, liver, lungs, pancreas & small intestines. Transplantable tissues include blood, blood vessels, bones, bone marrow, cartilage, connective tissues, eyes, heart valves & skin.

How to be an Organ Donor

Tell your near and dear ones about your desire to be a donor. In the unfortunate situation that you happen to become brain dead, your responsible relatives must express your desire to the treating doctor/KNOS. When your dear and near ones happen to be on life-support with irreversible brain damage, consider them as donors.

Mrithasanjeevani
Kerala Network of Organ Sharing (KNOS)

An initiative of the Government of Kerala
http://www.knos.org.in

Quiz winners!

QUIZ 7 Winners

Sumitha KC
Tech Asst (Lab)
Biochem, SCTIMST

Jyothilekshmi R
Staff Nurse, CSICU
SCTIMST

Smitha PM, UDC, Finance & Accounts Div
Hospital Wing, SCTIMST

Mereeta, DCVTN (2nd yr), SCTIMST

QUIZ 8 Winners

Ajeesh RS
II yr DCN Student
SCTIMST

Dr Francis Fernandez
TEM lab, BMT Wing
SCTIMST

Arathi AR
Dip NeuroNursing Stu
2nd Yr, SCTIMST

Jyothilekshmi R Staff Nurse, CSICU
SCTIMST

Smitha PM, UDC, Finance & Accounts Div
Hospital Wing, SCTIMST

Sumitha KC
Tech Asst (Lab) Biochemistry, SCTIMST

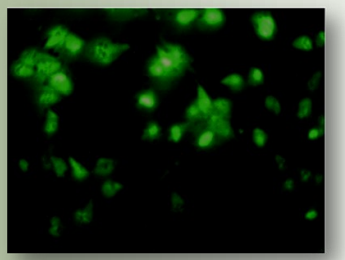
Fun page

Punching Applet on phone by Dr Anil PR, Tissue Culture Lab, BMT wing, SCTIMST

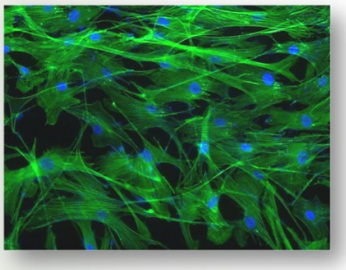
Pics by Kamalesh K Gulia, SDRL, BMT wing, SCTIMST

Winner of the Artistic Work Titles..

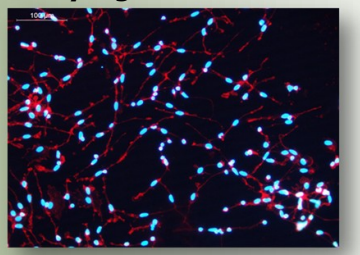
A Emerald Islands



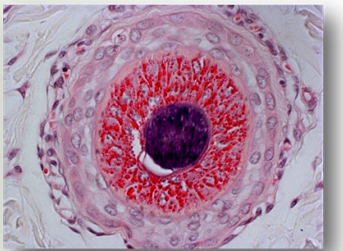
B Blossoming Neelakurinji



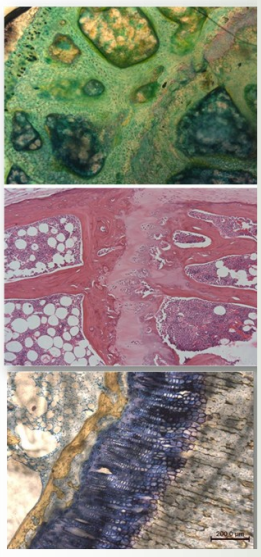
C City Lights



D The Pigeon's Eye

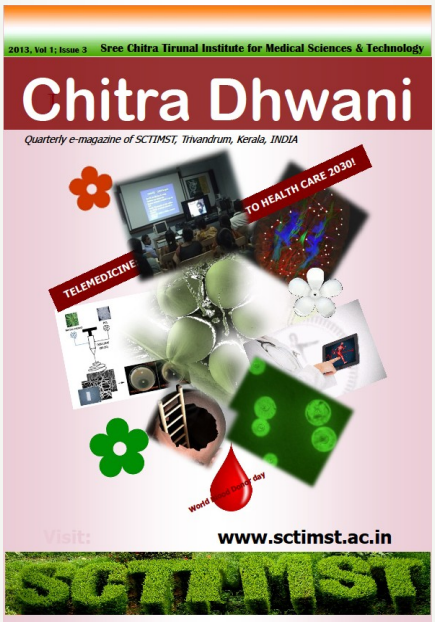


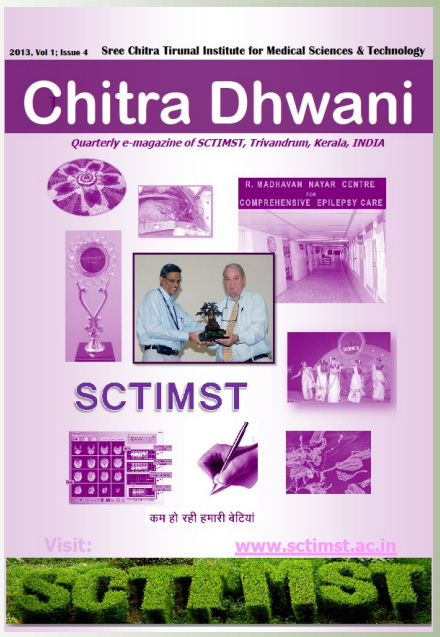
E Different Seasons on slides: Spring, Autumn & Summer

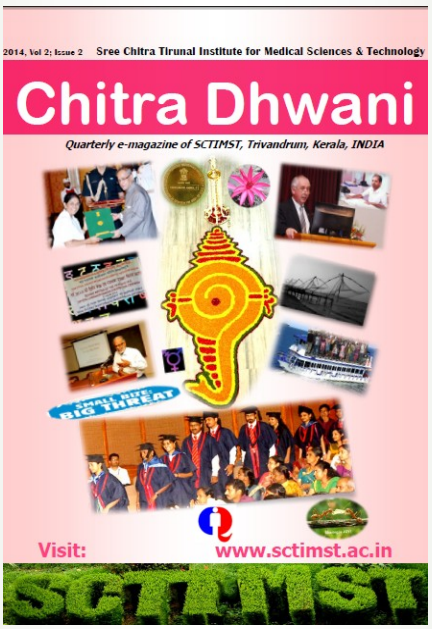


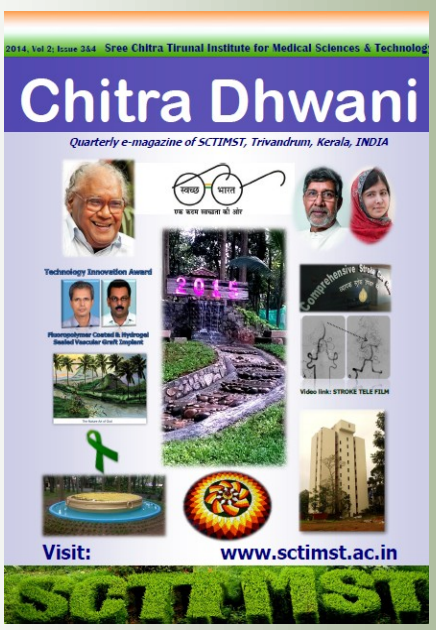
Arathi Radhakrishnan
PhD Scholar, SDRL
BMT Wing
SCTIMST

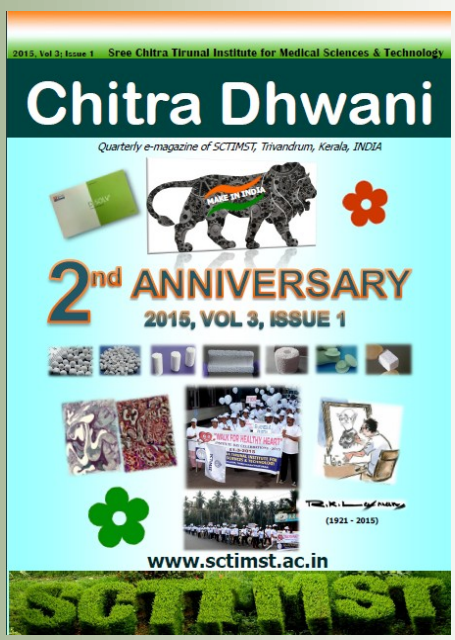
Three Years of ChitraDhwani : 2013-2015

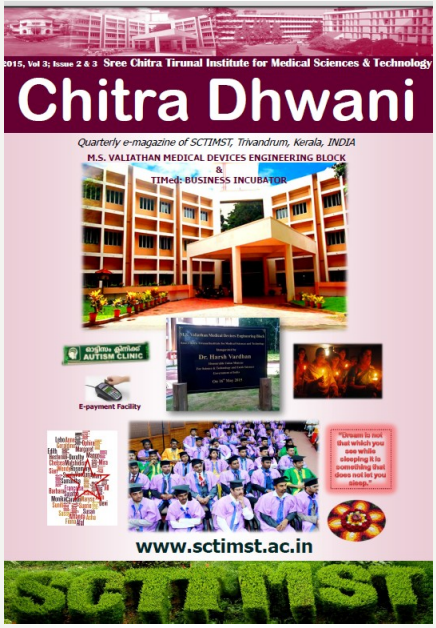












Sunset: A creative piece of digital painting by Ms Vasanthy M (Medical Illustration Unit). **Sunset creates unique atmospheric conditions such as the often intense orange & red colors of the Sun and the surrounding sky.**

Patron: Dr Asha Kishore, Director, SCTIMST

Editorial Team:

Editor: **Kamalesh K Gulia** (*Sleep Disorders Research Lab, BMT wing)*

Co-Editors: **Vivek Pillai** (*Dept of Cardio-Vascular Thoracic Surgery*)
Manju Nair R (*Achuta Menon Center for Health Science Studies*)
Neethu Mohan (*DTERT, BMT wing*)

Our Potential Reporters: Arathi R *(SDRL),* **Rahul** *(DTERT)*

Designing and layout: **Arumugham V** (*Calibration Cell, BMT wing*)
Kamalesh K Gulia (*Sleep Disorders Research Lab, BMT wing)*

Special Acknowledgements: Liji Kumar G and Vasanthy M (*Medical Illustration Unit*)
To one and all for their valuable Contributions

E-magazine by Research and Publication Cell, SCTIMST, Trivandrum, Kerala, India

Feedback may kindly be sent to: **enewsletter@sctimst.ac.in**
(*The articles are invited for the next issue and may kindly be sent to the above mailbox*)