

Chitra Dhvani

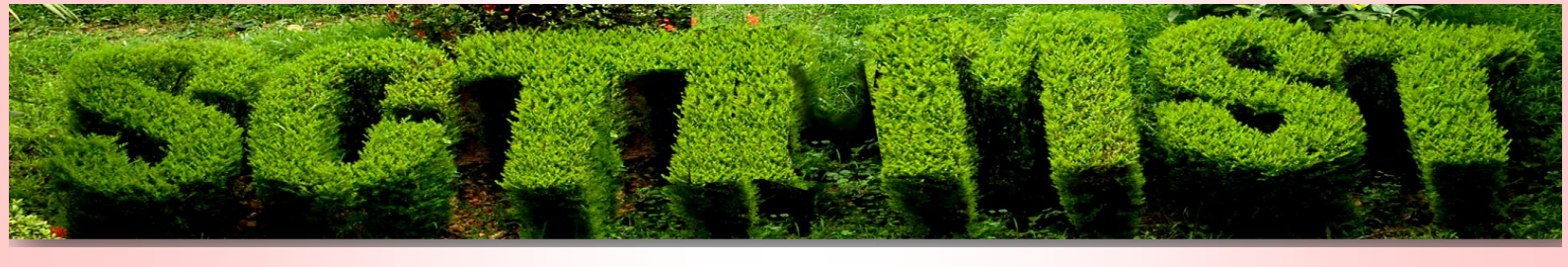
Quarterly e-magazine of SCTIMST, Trivandrum, Kerala, INDIA



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“Life is a series of punches. It presents a lot of challenges. It presents a lot of hardship, but the people that are able to take those punches and able to move forward are the ones that really do have a lot of success and have a lot of joy in their life and have a lot of stories to tell, too.”

From Editor....

A Letter from the Editor

Dear All,

I am delighted to present to you the next issue (2nd) of “Chitra Dhvani” for this year. I would like to express my heartfelt thanks to everyone for appreciating the anniversary issue. I share the credit of success with each and every member of our Chitra family for their invaluable contributions, experiences and suggestions in this magnificent endeavor.

Amidst excitement in air, Her Excellency Ms Sheila Dikshit, the Governor of Kerala awarded the Graduates in the prestigious 30th convocation of SCTIMST. Dr Simran's expression of the sentiments of proud graduates is applauded. The cover story on SAGA of DENTAL MATERIAL DEVELOPMENT...will give an excellent flavor of turmoil and hardships in developing novel technologies. A day at Library will provide an insight into digital library, a current norm these days.

It is continued proud moments for SCTIMSTians to congratulate Dr Sudhamani for adding yet another feather in Chitra's prestigious history. The new initiative, the 1st PK Mohan oration, by the Neurology team is truly commendable. Memory lanes by Dr Unnikrishnan will elegantly fly each of us in the nostalgic golden times.

This quarter of the year was again full of activities ranging from celebration of Institute day flavored with scientific sessions, celebration of health day, PD day etc. The IPR question bank and instances given will enlighten us on International patent issues. The FUN section as usual is packed with remarkable cartoons, incredible poems, pictures shots taken by camera etc.

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

Thanks and best regards

Kamalesh K Gulia

Editor
Scientist-D & In-charge
Sleep Disorders Research Lab
Comp. Center for Sleep Disorders
SCTIMST

New Directions..

Dr JM Tharakan
Director
SCTIMST



Chitra Dhvani continues to maintain high standards in quality and content and has become a must read periodical in the Institute. The credit for the same goes to the hard work put in by the editorial board and I wish them well in this endeavor. Chitra Dhvani has metamorphosed into an effective medium of communication that effectively show case the achievements of the Institute. I am sure the employees will utilize it to express and communicate their hidden talents for the benefit of their colleagues.

Three and a half decades of existence as an Institute of National Importance is a reasonable time span for us to reflect on what we could achieve and what more needs to be done. Needless to state that there is room for improvement on all fronts individually and collectively. Acquiring new knowledge and pursuit of new skills will continue to make us better suited to the tasks before us and in turn will be the drive engine for the Institute's growth and progress. **Let us all rededicate ourselves to our Institute's cause, so that it truly grows in stature and accomplishments worthy of its mandate to its people and we should be contented that we too contributed our might to the making of a great Institute.**

“The ultimate victory is derived from the inner satisfaction of knowing that you have done your best and that you have gotten the most out of what you had to give.”

Notions..

Er OS Neelakantan Nair
Acting Head, BMT Wing
Er-G (Sr. Grade) & Head
of Engineering Services



I am happy to note that an e-magazine 'Chitra Dhvani' is being published in the Institute with the active support of all staff and students of the Institute. I congratulate the Editorial Board for initiating such a venture which I feel, is a platform for every one of us to share our talents.

As all of us know that the SCTIMST was established by Parliament for a noble cause which gives the Institute a unique status in combining medical science and biomedical technology. The purpose of setting up the institute was to bring about a convergence of medical sciences and healthcare technology with the expectation that it will provide an impetus for indigenous technology development and the establishment of a medical devices industry in the country at a time when technology R & D was almost non-existent, and the industry was unwilling to invest in R & D. As an institution with the status of a University, it was also expected to develop human resources to support technology development and excellence in specialty healthcare.

I urge my fellow colleagues to carry forward the great mission initiated by the founders of the Institute and dedicate yourself in your duties and responsibilities so that 'Sree Chitra' will continue to serve the nation, fulfill the mandates given to it by the Parliament of India; explored and un-explored frontiers of health care and above all, discharge our responsibilities with diligent and humane care towards our patients.



SAGA of Dental materials development

History of evolution of dental products at SCTIMST..

In the early eighties, the success of the blood bag system and its transfer of technology to four industries within India had a strange after-effect. The Oral health task force in New Delhi identified and entrusted the Institute to develop dental products for which India was dependant almost totally on imports. Imported dental products were extremely costly and not affordable to the common man. Dental healthcare was a luxury those days and not considered a necessity. Prof MS Valiathan, who was the Director of the Institute at that time, entrusted Biomedical Technology wing group to initiate development of dental products based on the above request. Subsequently, a range of dental products were developed in the dental products laboratory (DPL) and transferred to industry during the nineties and early part of this century. They are available currently in the market under various brand names.

Composite dental restorative and related bonding agents were identified as the need-of-the-hour products. Developing these products indigenously and its subsequent commercialization contributed to reduce the burden of the import component in the economy substantially. As per a survey carried out in 2005 (The Hindu, November 29, 2005) the annual dental materials market alone accounts for Rs 3200 crores and about 80% of it is imported. A few dental products made in India are cements, amalgams, orthodontic brackets and wires, crowns and impression materials, orthodontic appliances and rubber dams. Extensive research work has been carried out in DPL during last 25 years on development of restorative materials which started with the synthesis of Bisphenol A - glycidyl methacrylate (BisGMA) using indigenous chemicals and the group successfully standardized the synthesis parameters. This method for preparing BisGMA has been accepted worldwide by many laboratories subsequently. Later, the group successfully developed self cure (chemical cure), non - radiopaque light cure, and radiopaque light cure composites, 3rd generation dentine bonding agent based on BisGMA and 5th generation single solution bonding agent (SSBA) based on pyromellitic glycerol dimethacrylate (PMGDM) and were commercialized (Trade Names: Restofill composite, Stedbond, Stedbond-S etc). The initial part of the dental composite work was carried out under the able

leadership of Dr SN Pal who subsequently left to take up a senior lucrative job in HLL Lifecare Ltd during early nineties. Prof Ashima Valiathan from Manipal University was the consultant dentist and mentor who carried out most of the animal experiments and who always remained a force behind us supporting this cause.



(I. Restofill kit containing composite, bonding and etchant, II. Stedbond -S Single solution bonding agent)

Development of the chemical cure composite was initiated first during 1988 with funding received from Department of Science and Technology (DST). It took about 3 years to develop and characterize the product. One of the major hurdles was in procuring the raw material BisGMA which is a precursor to the composite preparation as there were very few suppliers. The lab received about 100gms of the material as a gift from a dental school in University of Liverpool. This material was used as the control throughout. It was thought that it was better to synthesize the stuff in the lab itself and it was done within stipulated period of 6 months. Mind you, all these activities were done with temporary people who disappeared the moment they got a permanent job and new people had to be trained all over again.



Dr Mohandas, Dr Kalyana Krishnan and Er GS Bhuvaneshwar during launch of the Restofill kit at Chennai

By that time, chemical cure composite was developed, the light cure composite had begun to make inroads to all the dental clinics and became popular overnight. It had many advantages over the chemical cure ones including low shrinkage and less air bubble entrapment. So task had to start all over again and an extension of the ongoing DST project



was submitted which was granted. Light cure composite was developed within a year. In addition, a two-component bonding agent was also developed to go along with the kit. Further, dentists wanted radiopaque material and a radiopaque light cure composite was developed based on the demand. The animal trials took quite a bit of time and the products were ready for technology transfer during late nineties. All through this period, tremendous support was received from all the colleagues, especially Mr AV Ramani who was the Head of the Biomedical Technology Wing.

Development of a product was relatively easy compared to the task of translating the product to a viable marketable one. Also, it was realized that unless the developed product reaches the masses, it cannot be called a success. One of the biggest problems with Indian scientists is that everyone wants to stay in the comfort zone of publishing papers rather than take their product findings to industry and try to commercialize it. One of the main reasons for this is that most of the products developed are not cost effective and cannot withstand competition. They expect and wait for the industry to approach seeking the developed technology. To surmount this, it was thought that the initiative will be taken to try selling the technologies rather than wait for the industry. The mindset of the industry people is different from that of the scientist and unless one tunes accordingly, the transfer is likely to reach a dead end. Once a harmony is achieved between the two parties, then technology transfer and commercialization moves smoothly.

Interactions with industry

Dynamic Orthopedics, Always was the first industry to sign an MOU to absorb the dental composite technologies as a package in the turn of the century. They had a fine entrepreneur in Mr Vasudevan as their Managing Director who posted two of their scientists in DPL for training. The initial thrust was on commercializing light cure dental composite and the resin/primer bonding agent. However, the technology transfer went into difficult times as both the trained personnel left the jobs to take up permanent jobs elsewhere, and the company resorted to a go-slow attitude in commercializing the technologies. This forced the Institute to look for other entrepreneurs. About 3 years of valuable time was already lost. So, after a brief discussion, Dr GS Bhuvaneshwar, who had become the Head of the BMT wing by that time, inspired and suggested to pursue to some of the leading industrialists. The name of Dr Adhinarayanan, who used to be Dr Kalyana Krishnan's (Dr KK) colleague in Vikram

Sarabhai Space Centre for 2 years and who left mid-way to take up an assignment with Anabond Limited, an adhesive company based in Chennai, came to mind. He had already become the Head of their R&D Division. So, when a mail was sent to him.. lo and behold! After a week, Dr Adhinarayanan along with his CMD, Mr Vijayakumar and their marketing manager visited the institute and held meetings regarding the technology transfer. Right from the start, a great chord of camaraderie was struck between the Institute and Anabond which is continuing for the last 13 years. After discussions at various levels, an MOU was signed for absorbing a dental composite package technology kit from DPL. Anabond also liasoned with a pharmaceutical company called Stedman Pharmaceuticals based in Chennai. They formed a new company called Anabond-Stedman Pharmaceuticals Ltd and set-up a factory in Thiruporur in Kancheepuram District in 3 months flat-time for the production of dental composites. The signing of the MOU was followed with frequent visits between the industry and the institute. Prof Mohandas (Director then), Dr Bhuvaneshwar, Dr KK and Mr Ranjit (who was looking after the TT Cell during that time) went for the inauguration of the factory. They received a huge welcome at the airport by the company people with garlands and what not (Thank God, there were no nadaswarams). Everyone felt like newlywed bridegrooms but enjoyed every minute of it. After the inauguration of the factory and product launch, an MOU was signed right at the spot for transferring the technology of the radiopaque glass filler also. Chitra team members were asked to plant a tree sapling each at the factory premises. Now, these have grown into full blown trees.



Dr GS Bhuvaneshwar, Dr Kalyana Krishnan, Dr Mohandas, Mr Rajagopal (Stedman) & Mr Vijayakumar (Anabond) at factory inauguration

Anabond-Stedman altogether absorbed eight of the SCTIMST's technologies. They started marketing dental composite under the brand name Restofill and the bonding agent as Stedbond. Then, a Trivandrum product launch was also organized where Prof Jyotindra Kumar, Principal (Government Dental College, Trivandrum) received the first kit from Prof





(Factory set up for dental composite production at Thiruporur at Kancheepuram District near Chennai)

Mohandas. Subsequently, ASPR started producing 6 shades of composites and the single solution bonding agent technology was also transferred in 2006 which started selling under the brand name Stedbond S. Nano Flo, a flowable composite containing nanofillers, etchant etc. followed later.

The story of the dental composites will not be complete without mentioning the contributions made by a number of permanent and temporary research personnel who have toiled hard for the success of the products. Dr Lizymol, Dr Arthur Vijayan Lal, Dr Tamareselvy (currently in USA), Mrs Sheela (currently in Australia) and Mrs Usha (currently in New Zealand), Mr Manu are some of the names one can recall. The products are currently available in the market and have given all the imported products a ride for their money. 3M company, an MNC, which is the largest manufacturer of dental products in the world was forced to slash the prices of their dental composites substantially with the advent of Restofill. Dental healthcare became more affordable to patients within India. ASPR have started exporting the products also to many foreign countries. They intend to obtain CE certification soon so that these products can be marketed in European countries also.

Currently DPL lab is concentrating on developing more novel composite materials based on hybrid inorganic-organic resins called ormocers. Scientist-in-Charge of the DPL, Dr KK remarked ***"The laboratory intends to develop newer dental technologies in order to make dental healthcare more affordable. Our groups has recently developed a dental caries dissolving agent whose technology was transferred to Dr Toms International, Calicut. This is currently undergoing clinical trials and the product which is highly cost effective is expected to hit the market this September. With this, the lab would have transferred and commercialized 10 technologies"***.

(Contributed by Dr V KalliyanaKrishnan, Scientist G (Senior Grade) & Scientist-in-Charge, Dental Products Lab, BMT Wing, SCTIMST)

Emerging Trends..

The emerging nanomedicine prospect

Nanomedicine is relatively a new field in medical sciences and technology; a "medical application of nanotechnology" or "nanotechnology enabled medicine" with a high global commercial business activity. Its enormous potential is clear from the commercial success of several nanomedicines in the short span of time. Advances of nanotechnology in drug delivery, imaging, and diagnostics etc. will certainly change the medical treatment scenario including site specific or targeted drug delivery and theranostics (combination of diagnostics and therapy). The main applications of nanomedicine include delivery of pharmaceuticals, *in vitro*, *ex vivo* and *in vivo* diagnostics, including imaging, regenerative medicine and implanted devices.

Nanomedicine is defined as "the science and technology of diagnosing, treating, and preventing disease and traumatic injury, of relieving pain, and of preserving and improving human health, using molecular tools and molecular knowledge of the human body" by the European Science Foundation. Later in 2006, National Institutes of Health defined nanomedicine as "an offshoot of nanotechnology, which refers to highly specific medical interventions at the molecular scale for curing disease or repairing damaged tissues, such as bone, muscle, or nerve". Nanotechnology has been practiced from ancient time without even being known about it. Roman glass cage cup known as "Lycurgus Cup" is believed to be made in Alexandria during AD 290-325 period. This has been made by mixing a small amount of gold and silver with glass which turned red when illuminated by light. The technology behind it is known now being colloidal gold and silver. In transmitted light, nanoparticles scatter the blue end of the spectrum more effectively than the red end, resulting in red transmission. In reflected light it turns green. Particles are only of the order of 70nm and in visible transmitted light a surface plasmon resonance effect takes place.

Disease diagnosis, treatment and prevention will be revolutionized with the development of wide range of products with nanoscale technologies. With enormous potential applications of nanotechnology to healthcare, nanomedicine will transform new drugs into widespread use for the benefit of patients. Nanomedicine have application in drug delivery for fungal infections, cancer hepatitis, immunodeficiency diseases, chronic kidney disease, immunodeficiency disease, lipid regulation etc.; *in*

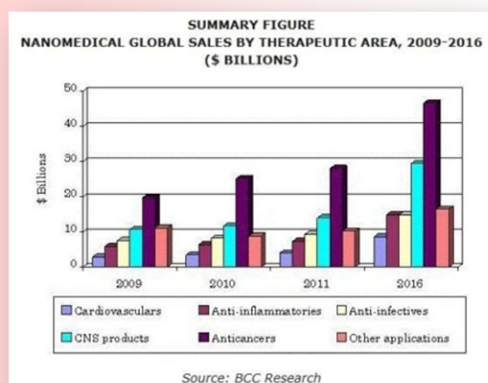


Emerging Trends..

vivo imaging for liver tumors and imaging of abdominal structures; *in vitro* diagnostics such as for pregnancy, ovulation, immunodiagnostics, HIV etc; biomaterial nanocomposites for dental filling, restoration and repair, bone defects and antimicrobial wound care etc. The present day trend around the world is to translate nanotechnology research into commercialization. The first nanoparticle based drug approved by FDA is Abraxane. Today, there are over fifty commercial nanomedicine products based on nanotechnology.

Global statistics

The worldwide market value of nanomedicine industry was \$50.1 billion in 2011 and is expected to reach \$96.9 billion by year 2016 and \$177 billion by year 2019 with a grow rate (CAGR) of 12.5% (Source: BBC Research). This accounts to 10% of total pharma sales and includes central nervous system, anti-cancer, cardiovascular and antibacterial products. The global market for cardiovascular segment is expected to grow at the fastest pace owing to increasing prevalence of cardiovascular diseases demanding drugs with improved efficacy and therapeutic properties. The Asia-Pacific region is expected to grow fast due to high unmet healthcare needs, research collaborations and increase in nanomedicine research funding in emerging economies such as China, India and other economies in the region.



Nanomedicine products on the market

Abraxane[®] a paclitaxel albumin-stabilized nanoparticle formulation is indicated for non-small cell lung cancer and for the first-line treatment of patients with metastatic adenocarcinoma of the pancreas. DaunoXome[®] a daunorubicin formulation is indicated for first line cytotoxic therapy of advanced HIV-associated Kaposi's sarcoma. Doxil[®], Myocet and Caelyx are

liposome formulations of doxorubicin for the treatment of patients with ovarian cancer. DepoCyt[®] is another liposome formulation containing cytarabine solution. NanoCrystal drug technology developed by Elan Drug Delivery is used for the formulations of fenofibrate, sirolimus, aprepitant and megestrol acetate. Skyepharma's Insoluble Drug Delivery (IDD[®]) platform technology supports improved solubility. Triglide[®] uses IDD technology. PEGylation is another technique to increase the potency of many drugs. Gold nanoparticles and magnetic nanoparticles are utilized in immunodiagnostics assays. In addition to these, there are less than hundred nanomedical products in clinical trials which expected to be in market in near future. They include nanomedicine like ticagrelor, azilsartan medoxomil and rivaroxaban for cardiovascular diseases; everolimus, sitagliptin and simvastatin, sunitinib malate, linagliptin for endocrinology etc.

Characterization of nanomaterials

Nanoparticles are defined as particles with a size distribution between 1-100 nm. Because of this nano size its physicochemical, biocompatibility and toxicity profile is different from their bulk properties. Therefore, characterizations such as its composition, structure, and various properties like physical, electrical, magnetic, etc. is extremely significant when these materials are used for human applications. Since the properties vary significantly with size and shape, the accurate measurement of nanoparticles size and shape is therefore critical to its applications. Particle size distribution is measured based on Brownian motion of the particles in suspension mainly by dynamic light scattering (DLS) and video tracking (nanoparticle tracking analysis, NTA). Imaging of nanoparticles and some surface characteristics are generally performed by using atomic force microscopy (AFM), scanning tunneling microscopy (STM) and near-field scanning optical microscopy (N-SOM). Transmission electron microscopy (TEM) and scanning electron microscopy (SEM) are also used to image nanoparticles at high resolution with additional analysis techniques like X-ray spectroscopy (E-DAX) are possible. Formulation stability is significantly important when nanoparticles are used in delivering drugs or for imaging purpose making evaluation of its zeta potential (Laser Doppler Velocimetry, LDV) an important characterization tool. It provides detailed insight into the causes of dispersion, aggregation



Emerging Trends..

or flocculation. Other general techniques used are common techniques like x-ray photoelectron spectroscopy (XPS), powder X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF), ultraviolet-visible spectroscopy, dual polarisation interferometry and nuclear magnetic resonance (NMR). Characterization of the active ingredient is equally important. It requires the general characterization techniques like high pressure liquid chromatography (HPLC), liquid chromatograph mass spectrometer (LCMS), circular dichroism (CD) etc. The study on the fate of nanoparticle after administration becomes possible by using different techniques like Laser Scanning Confocal Microscope (LSCM), Confocal Raman Microscope (CRM), *In vivo* image analyser etc. Most important characterization of nanoparticles is its biocompatibility and toxicity which is usually done by the prescribed international standards protocol ISO 10993.

Conclusion

Because nanotechnology focuses on the very small, it is uniquely suited to creating systems that can better deliver drugs to tiny areas within the body. Nano-enabled drug delivery also makes it possible for drugs to permeate through cell walls, which is of critical importance to the expected growth of genetic medicine over the next few years. The targetability and controlled release has been achieved by physico-chemical modification of these nanoparticles. There are few challenges in commercializing nanotechnology such as high processing costs, problems in the scalability of R&D for prototype and industrial production, the basic research orientation of the related sciences, concerns about environment, health and safety including nanotoxicity etc. However, utilizing nanotechnology, nanomedicine can eventually contribute towards cost effectiveness and competitiveness and may provide important opportunities to revolutionize medical science, technology and society.

Ref: Nanomedicine: From Drug Delivery to Imaging, Cutting Edge, 2(5), 13-17 (2014).

<http://www.spincotech.com/ebook/may2014/>

(Contributed by Willi Paul and Dr Chandra P Sharma, Facility for Advanced Drug Delivery Systems (FADDS), Biosurface Technology Division, BMT Wing, SCTIMST. *correspondence to: drsharmacp@yahoo.com)*

A day at Library...

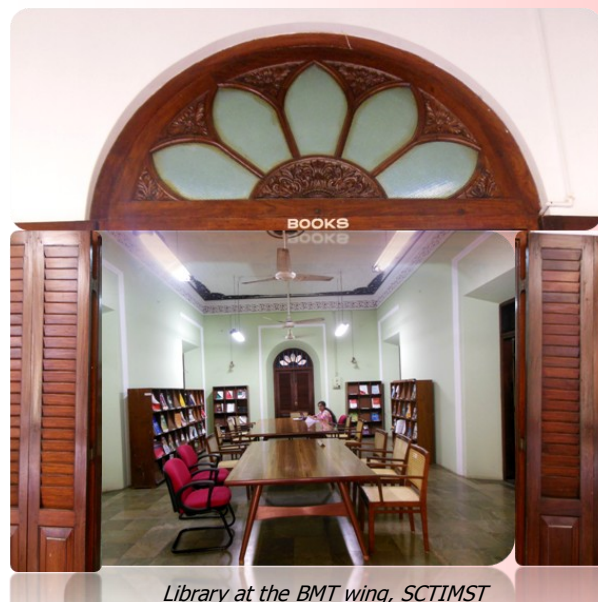
The SCTIMST Library is a special resource facility catering to the information needs of users/ user groups on disciplines that the institute supports. The library was started in 1974. The Institute has two libraries, one at Hospital Wing and another at Biomedical Technology Wing. Both libraries are rich in information resources. Being a member of **National Knowledge Resource Consortium (NKRC)**, the library has access to a good collection of e-journals in addition to those we subscribe. The library also has subscribed e-books as well as complimentary e-books. The Hospital Wing Library has 15000 books, 15600 back volumes and subscribes to 112 journals. The BMT Wing Library has 10800 books, which includes a good collection of standards and patents, 6000 back volumes and subscribes to 62 journals and Materials for Medical Devices Database developed by ASM International.

Efficiently managed by the staff (n=8), the major routine activities in the library pertains to:

- **Selection and acquisition of books, both print and digital version**
- **Cataloguing and classification, registering and activating the online access**
- **Subscription to journals (print & digital version)**
- **Circulation**
- **Preservation, both physically and digitally**
- **Information services**

Acquisition section

This involves selection, ordering and receiving. The indents for selected books by various departments with the recommendation of the Heads of Departments are received online and orders are placed after getting approval from the Library Committee and the Director. On receipt of books,



Library at the BMT wing, SCTIMST



A day at the Library...

they are taken into stock and relevant entries are made in the system. Digital resources like e-books and complimentary e-books are made available through library homepage. The arrival of new books is intimated to all faculty of the concerned department immediately via e-mail.

Cataloguing and classification

The books are classified and the details are entered in to the system for the effective performance of the online catalogue. The library stack in hospital are organized into collections: Anesethisology, Biochemistry, Cardiology, Computer, General Medicine, Microbiology, Neurology, Pathology, Radiology and AMCHSS. The reference books are kept separately and are not lent out. Within each collection, the books are arranged according to **the Dewey Decimal Classification number**. The library software has the facility to download MARC catalogue records. The books are displayed for a period of one month, before they are lent out.

Journal Section

Journals are the primary source of information available in print as well as to digital formats. The recent arrivals are notified through the library homepage. The journals subscribed by us and the journals available through NKRC are listed separately with link to the journal site.

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The registration of users is done at the circulation section. The employee code of the users is utilized as library membership code. The borrowing privilege depends on the category of the users. The circulation system tracks the usage of each library document as well as utilization by each user. The system has the facility to reserve books and other library documents by the users.

The books and other library documents are properly shelved after being used. Shelf rectification is done periodically to ensure their correct order.

Preservation

The journals are bound and kept as back volumes. Books that are worn out are also bound. The theses, dissertations and project reports of our institute are scanned in to digital format and uploaded in the Dspace digital library software along with the publications from our institute. The link to the Dspace digital library system is available in the intranet page.



Information Services

The library is doing the information retrieval services such as article search and patent search on specific topics which are required for research and is supporting the Research and Publications Cell in analyzing the articles published from our institute such as number of articles published each year, Author impact factor, etc.

Other Services

One-day membership as well as yearly membership is given to Post Graduate students in medicine and nursing and research scholars from other institutions. They do not have the borrowing facility. ID cards are provided to external members who require yearly membership.

On specific request from the users the journal articles that are not accessible to our library are received from other libraries. Our library serves other libraries by sending articles to other libraries on inter-library loan. All members including the temporary members can avail the Photostat facility.

Mr S Jayachandra Das informed that the current fully automated status of library was made possible by developing a software by their team. The library homepage has the facility to know the recent books and journals received, to search the books, standards specifications and cdroms databases and has links to other resources accessible to our Institute. EBSCO has given a trial offer to their search engine and e-book collection.

(Contributed by Mr S Jayachandra Das, Librarian-cum-Information Officer-I (Hospital), Ms Sudha T, Librarian-cum-Documentation Officer-II B (Hospital) and Mr Anilkumar C, Librarian-cum-Documentation Officer-II B (BMT Wing)

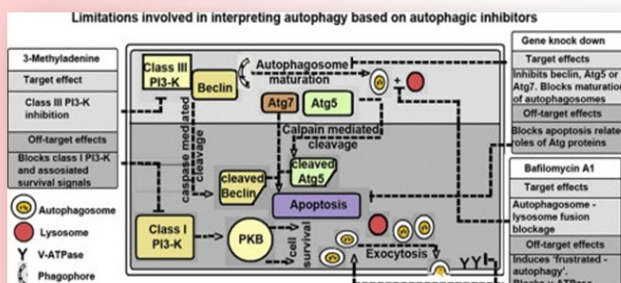


Research Highlights

Puzzles in autophagic inhibition..

It is a truism that some processes, by their very nature, are dialectical, more so all about life! Our life on earth balances and moves on carefully on a razor's edge in its own pace, not too fast (it hurts), nor too slow (it hurts too!). In the microscopic world, i.e., in all living cells, things are no different either. The review is about how to study such a life (death?) changing process happening in the basic units of life, the cells. The process as such is called as 'Autophagy', which literally translates to 'self-eating', but means more about efficient management of cellular resources/energy.

It is nothing but a cellular waste management program (actually it is housekeeping), which salvage redundant cellular components including worn out organelles, proteins etc., so that the homeostasis of internal milieu is sustained. But sometimes autophagy is blocked which fills the cells with debris and redundant proteins which not only is malfunctional, but blocks functions of other proteins. A cell will drown and die in its own debris. At the same time, an excessive operational housekeeping washes the essential resources down the drain! All the essential items will be systematically disassembled and thrown out! Here too, the final unifying outcome is cellular demise. To make matters worse this process is linked to hundreds of interconnected cellular signaling events, which can save a cell or condemn it. Like it was told earlier, too much autophagy hurts and too little autophagy, hurts as much too. This review attempts to provide a detailed overview about the practical constraints involved in using autophagic inhibition as a strategy to understand autophagy.



Ref: Vinod V, Padmakrishnan CJ, Vijayan B, Gopala S. *Pharmacol Res.* 2014 Apr; 82C:1-8.

“Medical science has proven time and again that when the resources are provided, great progress in the treatment, cure, and prevention of disease can occur.”

Maternal mortality in rural India Time to reset strategies for MDG-5.

Millennium Development Goals (MDGs) are some important milestones in different areas of development like economic growth,



improvement in living standards, and improvement in health which have been adopted by the international development community including the United Nations as goals to be achieved by all countries, especially developing countries, by 2015. MDG-5 relates to maternal mortality reduction. All over the world, several women die from child birth, and a disproportionate share are from South Asia including India. This paper relates to one example of an effort in this direction in the state of Gujarat.

SEWA-Rural is a voluntary organization set up by a group of Gujarati professionals most of whom have returned from abroad to work in one of the most backward districts in Gujarat, Jhagadia. A large proportion of the population in Jhagadia is tribal. In addition to running a base hospital for the district, SEWA-Rural also has a community outreach program where rural and tribal women health workers, 'Arogyasakhis', work in the community to improve the people's health.

This study is based on the data collected from the SEWA-Rural, on the history of 32,893 pregnancies from 2002-2012 in the area, which resulted in 29817 live births and 80 maternal deaths. It tries to link the efforts of the SEWA-Rural program to the outcomes of these pregnancies over time, and see how they match the efforts to reach MDGs. Maternal mortality ratio-MMR or the ratio of maternal deaths to 100000 live births per year, improved from 607 to 161 over this period. Institutional delivery rate, or the proportion of deliveries happening in hospital, improved simultaneously from 23% to 65%.

The study revealed that a large proportion of deaths due to ante- and intra-partum bleeding, as well as deaths occurring at home, were avoided in this period. However, many of the indirect causes of maternal deaths eg. anemia, young age & malnutrition of the mother, and other co-existing diseases existed. The study concluded to have more broad based interventions to reach the MDGs.

Ref: Shah P, Shah S, Kutty RV, Modi D. *Trop Med Int Health.* 2014 May;19(5):568-75

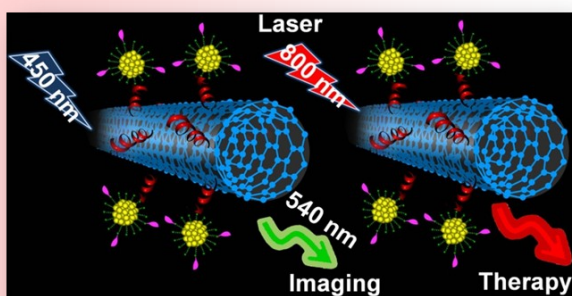


Research Highlights..

Q-dot tailored to single wall C-nanotube: A Multifunctional hybrid nanoconstruct for cellular imaging and targeted photothermal therapy

A quantum dot is a semiconductor materials that are small enough to exhibit quantum mechanical properties. It exhibit size dependent fluorescence emission due to quantum confinement. Single wall carbon Nanotubes (SWCNT) are tubes of graphite which has got extra ordinary properties of thermal conductivity. The properties exhibited by these two materials viz. Size tunable fluorescence emission and high thermal conductivity are of immense use in the field of diagnostics/imaging and cancer treatment. However, major challenges in using them in biomedical fields like poor aqueous solubility and biocompatibility and high toxicity make them undesired candidates, inspite of their favourable properties.

We have not only addressed these issues of water solubility and biocompatibility to a great extent and also developed a hybrid nanosystem comprising single wall carbon nanotubes and quantum dots (Qd@CNT) for cancer theranostics, so that the desired properties of the two seperate systems are incorporated in a single unit. Cancer targeting efficiency has been imparted to the developed unit to avoid the risk of damaging normals cells and tissues . Little effort has been made so far to study the fluorescently labeled quantum dot conjugated single wall carbon nanotube for cancer cell imaging and photothermal therapy. In this article, we report the synthesis, physico-chemical and biological characterization of the hybrid nanomaterial. Additionally, the cancer targeting efficiency, diagnostic and therapeutic efficiency have also been demonstrated at cellular level. A schematic representation of the hypothesis of the paper is depicted in the following image.



Ref: Nair LV, Nagaoka Y, Maekawa T, Sakthikumar D, Jayasree RS. **Small** 2014 Apr 1. doi: 10.1002/sml.201400418

Special moments!

80th Birthday celebration of Dr MS Valiathan



Eternal Eighty

We know,
When someone like you dream even the time standstill!
Celebrating your eightieth,
Is a proud moment for us all.



Sree Chitra's medical fraternity celebrated the 80th Birthday of their most beloved founder Director, Padam Shri Dr MS Valiathan. In full enthusiasm, former colleagues of Dr Valiathan, students mentored by him and many well-wishers from various walks of life in the city made the day very memorable. Even, the first patient who received the Chitra valve, Mr Murali who is successfully leading 24 years of his life post-surgery joined the celebration with great pride.



Special moments shared by Murali who is the first recipient of the Chitra valve



Memory Lanes...

DOWN THE MEMORY LANE....

Over three decades at SCTIMST, I am profoundly blessed and fortunate to have been part of this great institute and continuing. Herein, I plan to dwell mostly on my early days since contemporary status is the living present, not so relevant to the title provided.

Born in a picturesque but sleepy village in Thrissur, I had my medical graduate and post-graduate education at JIPMER, Pondicherry. As I had walked down the portals of Trivandrum Medical College in the early 1980s, to put in an application for MCh course in Paediatric surgery, I had noticed the elegantly painted 4-storey building and the surgical block (later I understood that only structure was then completed for the later). I knew nothing more about the great institute-in-making or about MS Valiathan, already a living legend by then. I had thereafter the good fortune to work with Dr TM Joseph, which paved the way for me to take up Cardiovascular and Thoracic Surgery as my specialization. Thus, I put-in my application in January 1982, went through the written test and interview and got admitted to be trained under Prof Valiathan in Sree Chitra Institute in Cardio-vascular Surgery in March same year. The first batch of residents in the whole institute was only 7. The current strength of residents has now grown at amazing numbers with newer and newer courses and training programs being started. As time went on I had the good fortune to start MCh course in Vascular Surgery for the first time at national level and also prepare the curriculum for Medical Council of India.

Number of faculty was small and residents were smaller still. Yet work environment was pleasant. I had comfortable times during my entire residency. We had exclusively an elective list which was well planned the previous week. I used to be tensed at night duties where I was the only doctor in Surgical ICU, and had to manage patients in ICU (post-operative) as well as cardiac surgery ward. From JIPMER to Sree Chitra, both being similar institutions (to my mind), the transition was smooth. Both Prof Valiathan and Prof Mohan Singh were quite accessible for opinion and doubts, in fact they welcomed any clarifications even during mid-night or in the early hours of the day. Interaction with cardiologists was close with stalwarts like Prof KG Balakrishnan and Prof CG Venkatachalam to name the senior most in a friendly group of medical colleagues.

During stay duty, we used to share the 'Johns Hopkins' bed – 3-tier bed, like in trains, to straighten for a few moments or an hour or two at the most during the night.

Sir (Prof Valiathan) used to be meticulous and would explain to us and nurses – particularly in ICU – about details of patients' condition, procedure and what to expect down the line. His bed side manners would profoundly influence my life, his compassionate attitude to patients and whole-hearted explanation to patients' relatives would be benchmark attitude for my future. Such detailed discussion I had never ever witnessed till then.

Sir would know the minutest details of all patients with his sharp memory and moreover would provide clear instructions when we would want his advice any time day or night. There are things that surgeons have to do by themselves. In ICU, an eight year old girl (Tetrology of Fallot – blue baby) was recovering after systemic-pulmonary shunt and developed hypotension and required nor-adrenaline infusion during the first month of my residency. A cut-down (placing a plastic tube into a peripheral vein and advancing its tip to SVC/IVC so that vasoactive medications could be infused) was required for noradrenaline infusion. Sir readily came to ICU at 10pm and he was happy that I could do the procedure in 5 minutes with Dr Waiker assisting me.

As for attending the conferences, my first conference of combined Cardiological and Cardiac surgical meet in 1983 was at Chennai. A month or two prior, he called me to his office and dictated the abstract about clinical evaluation of Chitra soft shell oxygenator off hand to my great surprise. This practice, I could copy to help my residents now a decade or two later. He has been the driving force for me for medical writing and more importantly development of India's first and only indigenous vascular graft prosthesis (CHITRA ITK graft).

Residents used to make presentations and seminars in Auditorium I in combined meetings which provided great experience and confidence in later life; with the result, I vividly remember my seminar on Tetrology of Fallot, Cardio-pulmonary bypass and 1st journal club which was on an article by Gordon Danielson of Mayo Clinic on repair of Ebstein's anomaly in 43 patients with excellent results that became benchmark thereafter.

I clearly remember a conversation with Dr Suresh of Cardiology (who had a long and successful career in Trivandrum Medical College) regarding minimally invasive cardiac and vascular procedures. He said a time would come when closed mitral valvotomy we routinely do using thoracotomy and Tubb's dilator will be replaced by cardiac catheterisation the device/balloon entering via femoral vein into the heart chambers to dilate





the mitral valve. Having seen Tubb's dilator and done the procedure myself, I thought it was a funny idea of an upcoming cardiologist and a wishful thinking at that. But time has proven that surgery has totally been outclassed and percutaneous procedure is the one now exclusively performed for mitral stenosis.

As mentioned earlier, I have put down events during my early days in Chitra. The atmosphere, with excellent team work, state-of-the-art facilities, attention to fine details and focused approach to patient problems in our uncrowded and calm facility has been the hall mark of my experience then and ever since. There are many, many instances where vascular patients who reported on the verge of fatal ending could be salvaged due to cohesive and focused team work very special to our institute. Meeting and training under Prof MSV sir has been the life changing experience for me forming solid foundation to my professional career.

I have had the good fortune to train at the Institute early at its existence among faculty who were committed and dedicated whole-heartedly. I should mention Prof Mohandas (Anaesthesiologist - and later Director), Prof KG Balakrishnan (Cardiologist), Prof D Rout (Neurosurgeon), Dr Mohan PK (Neurologist) and several of their team members. Being able to interact and discuss directly with most of them, when needed, was a unique opportunity available at Sree Chitra then.

I recollect several patients affected with vascular illnesses and the procedures I could partake in OR which led to my passionate approach to this specialty. I shall mention about 2 examples. One patient had minimal symptoms due to a well palpable abdominal aortic aneurysm. CT scanner was not commissioned then so we were performing DSA for diagnosis, confirmation and planning therapeutic strategy. DSA was reported normal (often lumen filling with dye may not be very much enlarged as thrombus will not be visualized). Patient was initially deemed not having an aneurysm. During subsequent discussion and

surgery following, a large aneurysm was evident. Another patient from Calicut was sent to us for management of hemoptysis probably due to bronchogenic carcinoma in upper lobe of left lung. While on rounds the day before surgery (on a Sunday), I was evaluating him with the provisional diagnosis of Ca lung. A small indistinct mass was evident but not characteristic of the diagnosis. Then going through the referral letter, professor of medicine (Dr Warriar from Calicut) had clearly mentioned that during one of his rounds the patient had developed massive hemoptysis. This made me think that a large bleed in the setting of an indistinct mass (haziness) must have a vascular basis. Surely later a subclavian aneurysm was diagnosed and patient underwent repair of distal aortic arch aneurysm on cardio-pulmonary bypass and recovered well.

My close interaction with Dr Ravi Mandalam, specialist in Diagnostic and Interventional Vascular Radiology with his amazing knowledge and application had contributed to my vascular experiences in those early days. I must mention about Dr Ramani, Dr Bhuvaneshwar and Dr Arthur Vijayan Lal who sustained my interest in bio-medical research in my early days.

The serene and peaceful Chitra atmosphere was what kept me magnetized and glued to this institute over 32 years. I am pertaining to the family-like team work which is trademark, almost unique to our place. The role, our nursing staff has played is extraordinary, dedicated and truly befitting to be called "unsung heroes". They took and continue to take care of patients losing sleep, and carefully attentive to their allotted patients which contributed immensely to patient welfare and the institutions reputation in the society – both among people and medical professionals. I recollect a few examples to illustrate my point.

On a Sunday, an 8 year old boy who had undergone repair of TOF (blue-baby) was brought to OPD. The baby looked weary and fatigued, but not yet in critical condition. Nurse on duty (Sr





Sitting: MS Valiathan, G Parthasarathy (President), Narasimhan (Registrar); Standing (back row): Joseph Joy, Subba Rao, Anand Kumar, Suresh, Sankar Kumar; Standing (middle row): Ravi Subramaniam, Krishnan, AK Gupta, Venugopal and me (Unnikrishnan M)

Anandavally Amma) felt the boy's pulse and found it was very slow - 30-35 beats/min. She immediately alerted the duty doctor, admitted the boy in ICU where he was treated averting a disaster. She also interrogated the father and noted the reason for severe life-threatening bradycardia was because the pharmacist advised to take 5 tablets of digoxin a day (prescription mentioned 0.125mg whereas a tablet strength is 0.25mg. Instead of 1/2 tablet, he advised the father to give the boy 5 tablets/day).

Another instance, in the then Thoracic and Vascular ward, a patient who had undergone percutaneous angioplasty earlier in the day, developed concealed haemorrhage leading to cardiac arrest. Sister on duty who witnessed the event (Sr Thankamma Chacko) gave a precordial thump and pushed the patient's bed to ICU where he was resuscitated and later on left hospital in good condition. Even more dramatically, a young post-operative cardiac surgery patient, after recent dismissal from hospital after surgery was brought to Out-patient department nearly in cardiac arrest condition. Sr Thankamma KK acted expeditiously, along with a 1st year resident, resuscitated and admitted to ICU for management leading to patient's survival. There are many more such.

Vascular specialty which I am presently practising had become my way of life exclusively due to my being at Sree Chitra portals with its high-quality academic atmosphere, high class investigating supports, multi-team approach of all specialists and the commitment and dedication of 'Our Chitra Family'.

M. Unnikrishnan

(We are thankful to Dr M Unnikrishnan, Sen Prof at Division of Vascular Surgery, SCTIMST for sharing wonderful memories and rare pictures in the e-zine)

Quiz Masters..

Quiz Masters DM Cardiology Residents

**Dr Vekaria Ketan Manubhai &
Dr Patel Nilesh Parshottambhai**

1st Prize

IAE Echo Quiz, Feb 9, 2014

**Dr Patel Nilesh Parshottambhai &
Dr Arun Gopalakrishnan**

1st Prize

**Dr Vekaria Ketan Manubhai &
Dr Hariharasubramonia Sharma**

2nd Prize

ICC Kerala 2014 Quiz, Feb 22, 2014

Dr Hariharasubramonia Sharma

3rd Prize

**CSI Annual Meet
Hemodynamic Quiz on Dec, 2013**

**Dr Bharatraj R Banavalikar
& Dr Srinivasa Prasad**

1st Prize

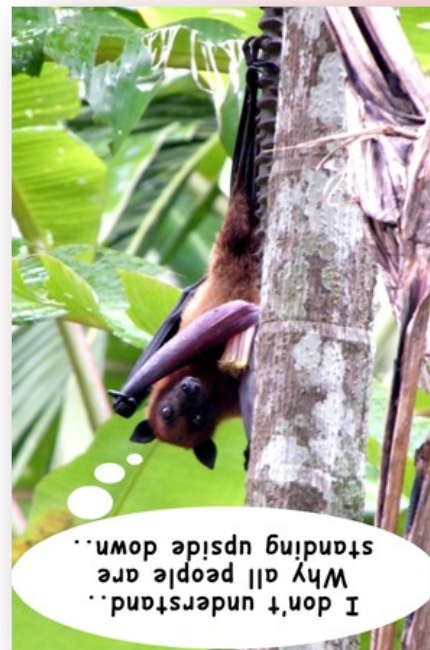
KHRS EP Quiz on March 23, 2014

Quiz Masters Radiology Residents

Dr Praveen A & Dr Rasmiranjan Padhi

2nd Prize

**Interventional Radiology Quiz
by ISVIR at Hyderabad in 2014**



New Initiatives: PK Mohan Oration

The first PK Mohan Oration



Dr L Torbjorn Tomson from Karolinska Institutet, Stockholm (Sweden) delivered the first PK Mohan oration amidst galaxy of several distinguished Professors, scholars, clinicians, from various medical colleges. Dr Tomson's lecture on "Epilepsy: The Global Challenge" was lucid and pertinent. With 65 million people affected worldwide, epilepsy is the most common chronic serious neurological disease, affecting more people than multiple sclerosis, Parkinson, cerebral palsy and muscular dystrophy combined. He highlighted global scenario of how people with epilepsy suffer from discrimination, misunderstanding, social stigma, and the stress of living with a chronic unpredictable disease which can lead to loss of autonomy for activities of daily living. The lives of these people is adversely affected due to gaps in knowledge, diagnosis, treatment, advocacy, education, legislation and research. He emphasised the need and role of collaboration between ILAE, IBE and WHO in the Global Campaign Against Epilepsy in combating epilepsy.

The first PK Mohan Oration was a very solemn and dignified one. Most of heads of departments and professors contemporary to Dr PK Mohan attended the program. Dr K Mohandas, VC (KUHAs) was the Chief Guest. Dr D Rout, Past HOD Neurosurgery; Dr Mathuriya, HOD Neurosurgery, PGIMER, Chandigarh; Dr VRK Rao, past HOD Neuroradiology; Dr John Tharakan, Past Prof of Neurology SCTIMST; Prof CC Kartha, Past HOD Cellular and Molecular Cardiology and current Professor at RGCB; Dr Hameed, past Medical Superintendent of SCTIMST were among the other dignitaries. The oration was attended by a large number of alumni of the department of Neurology.

Dr PK Mohan (1948-2005)



Dr Pochiraju Krishna Mohan, the eldest child of an agricultural family in Tenali, was born destined to serve patients. He did his MBBS and MD (General Medicine) from BHU under Prof Kattiyar and DM from AIIMS under Prof Vimla Virmani. Dr PK Mohan joined Sree Chitra in Department of Neurology in 1976 and displayed exemplary skills during his service tenure of 16 years. Dr Mohan built up an excellent department, introduced the specialty clinic concept by starting the exclusive clinics for epilepsy, neuromuscular disorders and pain. He bought the first Video EEG machine in 1992 and was a wizard of Electrophysiology and Digital EEG. He started the Speech and Hearing laboratory and initiated the speech and communication project which later turned out to be the ICCONS. His special research interest was focal motor neuron Disease. Having inherent flair for teaching and training, he set up the teaching schedule for the department, which is being continued even today. A True cosmopolitan, Dr Mohan served as member of several committees with integrity and impartiality in the Institute.



Dr K Mohandas , Dr JM Tharakan, Dr Torbjorn Tomson, Dr Sarada & Dr MD Nair lighting the ceremonial lamp on the occasion.



Chitra's Stars: Awards for Poster Presentations



Ms Ariya Saraswathy, PhD scholar, Biophotonics and Imaging lab, BMT wing (Guide: Dr Jaysree RS) has won Best Poster Award at the 2nd International Conference on advanced Functional Materials held at Trivandrum during February 19-21, 2014 paper "Super paramagnetic iron oxide nanoparticles for in-vivo magnetic resonance imaging of Liver Fibrosis.

Dr Rupesh Kaushik, DM, Cardiology won the "Young Investigator Award" at KHRS Meeting at Thrissur on March 23, 2014



Dr Sandeep N, Senior Resident, DM Neurology has won the Poster Award 2nd for the paper titled "Blood pressure and its variability in acute ischemic Stroke-in hospital and short term outcome" for the at ISACON 2014, the 9th National Conference of the Indian Stroke Association held at Trivandrum from March 14-16, 2014.



Chitra's Stars: Innovative Young Biotechnologist Award 2013



Dr Sunita Prem Victor, Chitra Fellow-C, Polymer Division, BMT wing has been awarded the prestigious "Innovative Young Biotechnologist Award 2013 (IYBA 2013)" from the Department of Biotechnology (DBT), Government of India for her research titled "**Multifunctional Hydroxyapatite/ Lanthanide core Shell Nanoparticles for Near-Infrared Theronostic Imaging**". The award carries a research grant of Rs 45 lakhs for 3 years along with a cash awards of Rs 1 lakh per year.

Congratulations! Congratulations! Congratulations! Congratulations!



Chitra's Stars..

National Florence Nightingale Award 2014



Dr Sudhamani Amma, Nursing Superintendent, SCTIMST, is conferred with National Florence Nightingale Award for year 2014 by the President of India, Pranab Mukherjee during prestigious ceremony in Rashtrapati Bhavan, New Delhi on May 12. This award is given to Dr Sudhamani Amma for public recognition of her valuable services to community as nurse. Dr Sudhamani is one of the rare gems of Sree Chitra. With over 33 years of experience, she has demonstrated leadership qualities in frontline nursing roles by creating standards of excellence. She has published a nursing manual for hospital nurses and has developed the curriculum for a certificate course. She has played a leading role in organizing nine state-level and three national conferences. She has been accoladed as the best nurse by TNAI, Kerala state branch in 2006. The award carries Rs 50,000 and a merit certificate.

Australia Awards Ambassador



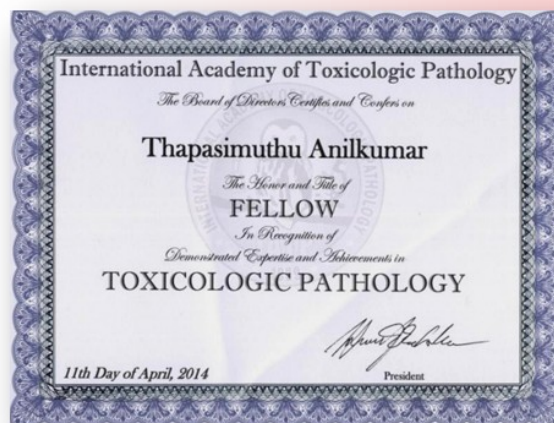
Dr RS Jayasree, Scientist D (Biophotonics and Imaging Laboratory, BMT wing), SCTIMST is appointed as an Australia Awards Ambassador by the Australian High Commissioner to India, Mr Patrick Suckling. Dr Jayasree is one of the Australia Awards Ambassadors to raise the visibility of the scholarships through presentations at top research and higher education institutions across India. She joins the elite network of leaders in India to encourage a new generation of high-performing Indian students to broaden their experience through an education scholarship in Australia. The award ceremony was held in New Delhi on March 28, 2014.

“ A Nurse is the one who go above and beyond the call of duty, who is the first to work and the last to leave and above all, who is the heart and soul of caring’

Fellow of the International Academy of Toxicologic Pathology (IATP)



Dr Anilkumar TV
Scientist-F
BiMT wing
SCTIMST
Fellow of IATP



Fellows of IATP are the scientists who have achieved expert status in the practice of toxicologic pathology through scientific leadership and innovation which benefits society & their profession.



Convocation 2014 (30th Batch)

In the prestigious Convocation Ceremony of 30th Batch, 94 Graduates were awarded degrees on May 23, 2014. Proud Graduates were awarded degrees for Doctor of Medicine & Magister Chirurgiae (21), Post Doctor Fellowship & Post Doctoral Certificate Course (18), Doctor of Philosophy (including CMC, 11), Master of Philosophy (10), and Master of Public Health (including CMC & NIE, 33).



Welcome Address

Dr Jagannathan A Tharakan

Director, SCTIMST



Convocation Address

Smt Sheila Dikshit, Her Excellency

The Governor of Kerala



Presidential Address

Mr KM Chandrasekhar

President, SCTIMST



Smt Sheila Dikshit, Her Excellency, Governor declaring the opening of Convocation ceremony.

“ While congratulating the outstanding students who have proved their credentials in respective disciplines, I also hope they will bear in mind the lofty ideals that have motivated the founding fathers to start this centre of learning. Outside the portals of this institution, a large world waits in anticipation that the many ailments they are subjected to will be mitigated”

Reply by a New Graduate

Her Excellency, Smt Sheila Dikshit, Governor of Kerala, Esteemed President and Director of the Institute, Our beloved Dean, respected heads of departments and teachers, fellow graduates, ladies and gentle men. At the outset, I would like to congratulate all my fellow graduates in all disciplines on this memorable day of our lives.

Our tryst with Sree Chitra started over 3 years ago, when we all sat in this very auditorium and wrote the entrance examinations, and with lady luck shining on us, we got in and the rest, as they say is history. These years moulded and transformed us into super specialists or scientists or public health experts, and more importantly these years changed our lives all around, forever. We thank all the people who were instrumental in our transformation.

Sree Chitra, as an institute has moulded some of the finest in their art and continues to do so year after year in all its 3 wings. Now it's not only our Alma Mater but a new home for us, to come back to. This institute has inspired us in so many ways and our exposure to the unique facility of a super specialty hospital, a biomedical technology wing and a centre for Health science studies has kindled the researcher in many of us. When I joined Chitra, I was told that this place is a 'true learning institute'. And that's what defines this place and that's the impression we take back with us.

Everyone in the Institute has in some way, directly or indirectly, played a role in shaping us into young super specialists and scientists, who now return to



Convocation 2014..



society to serve our people. This would not have been possible without the combined effort of everyone present here. I would like to thank all the members of each of our respective departments, not only the faculty but also our junior colleagues and the staff members of all non clinical specialities, the nursing staff and other categories of employees of the institute. All their contributions foster an environment which is most conducive for a holistic approach towards the practice of highly specialized medical and surgical services, technology development and public health related research and teaching.

I would like to thank our families who have supported us in this journey, our parents who have always encouraged our passion to pursue higher

studies and specialization, our husband and wives, sons and daughters who have made all the compromises and paid the price to help us fulfill our dreams.

All of us here today take with us a piece of the legacy of Sree Chitra and it is our duty to do justice to it in the future hence forth on.

For all of us, this qualification is the beginning of a journey and I wish everyone of the new graduates the very best in their life's endeavors, for some like me it is also the realization of a long-cherished dream and to them I would like to say, welcome aboard.

Thank You.

(Dr Simran Kundan)



Institute Day Celebration 2014: Science Fete



Shri Bharat Bhushan, honorable Chief Secretary, Govt of Kerala inaugurating the Science Fete during Institute day celebrations



In scientific presentations, 1st prize was awarded in 4 different categories. Award winners are Elezabeth Mathews (Public Health), Ratnasari K & Sudesh Yadav (MTech), Mohammed Idhrees A (Clinical) and Tara S (PhD)



Events held at SCTMST.. World Health Day

SMALL BITE: BIG THREAT

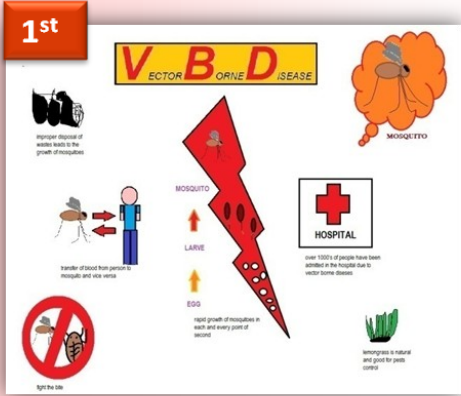


Dr Jacob John T, Former Prof Emeritus ,CMC Vellore delivering talk on vector borne diseases during World Health Day



Dr Jaysree on gender issues

Awardees of the E-poster competition organized during World health day



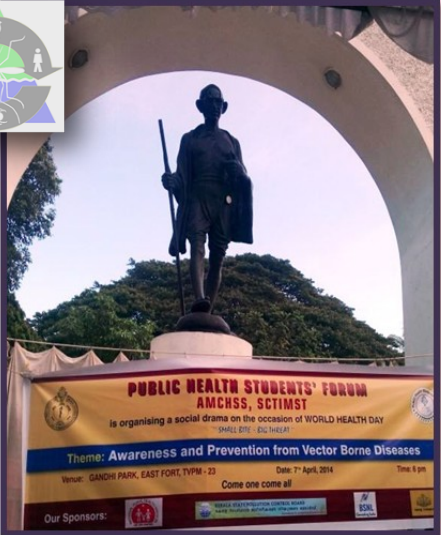
Simhita Srinivasan



Aswathy



SriPadma



Social drama on vector borne diseases by MPH students at Gandhi Park, East Fort during World Health Day



Events held at SCTMST..

World Parkinson's Day



RTPMED-2014: Three Days Intensive Residential Training Workshop



Dr Jagan Mohan Tharakan, Director (SCTMST) inaugurating the training program. Dr Chandra P Sharma, Head (BMT wing), Dr Rajiv Tayal, Advisor (DST) and Dr KS Rao graced the occasion.

RTPMED-2014, an intensive residential training program on '**Toxicity, Safety, Biocompatibility Evaluation of Materials, Medical Devices and Combination Products**' was organized by SCTMST during February 17-19, 2014 at Hotel Residency Tower, Trivandrum.

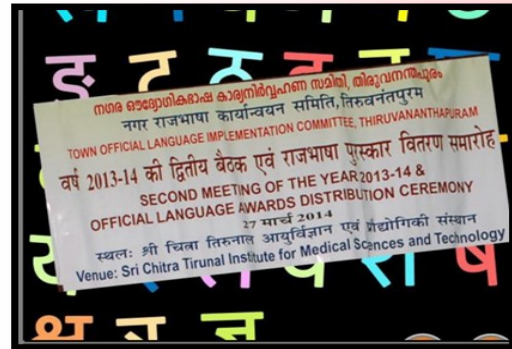
The training program was aimed to discuss and share an in-depth knowledge of the recent advances in the evaluation of biomaterials, medical devices and combination products. This structured

training program provided an update on the current status of biocompatibility evaluations as per ISO, FDA and EU regulations. The know-how originated from this training was greatly useful for the scientific community, technologists, industry and regulatory authority for sharing the new trends in the safety, biocompatibility evaluation of materials, medical devices and combination products. This unique event was attended by the distinguished scientists & technologists from various parts of India.



Events held at SCTMST..

Official Language Awards Distribution Ceremony 2013-14



In conversation with Game changers: Sri Sankar G, Architect



Events held at SCTMST..

SROP, Senior Residents Orientation Program at the BMT mwing



Animal Handling Training Program at the DLAS in the BMT wing



In focus: Intellectual Property Right..

Is there an International/Global Patent?

No. There is no International or Global Patent. An inventor has to file an application in each Country, where he seeks to protect his invention. There are regional and/or International treaties to facilitate the procedure to seek protection like Patent co-operation Treaty (PCT) or European Patent Convention (EPC)

What is patent cooperation treaty (PCT)?

The patent cooperation treaty (PCT) is a multilateral treaty entered into force in 1978. Through PCT, an inventor of a member country (Contracting state of PCT can simultaneously obtain priority for his/her Invention in all/ any of the member countries, without having to file a separate application in the countries of interest, by designating them in the PCT application. India joined the PCT on December 7, 1998.

What is the need for PCT?

In order to protect the invention in other countries, it is required to file an independent patent application in each country of interest; in some cases, within a stipulated time to obtain priority in these countries. This would entail a large investment, within a short time, to meet costs towards filing fees, translation, attorney charges etc.

Inventors of Contracting States of PCT on the other hand can simultaneously obtain priority for their inventions without having to file separate application in the countries of interest; thus saving the initial investments towards filing fees, translation etc. In addition the system provides much longer time for filing patent application in member countries. The time available under Paris Convention for securing priority in other countries is 12 months from the date of initial filing. Under the PCT, the time available could be as much as minimum 20 and maximum 31 months. Further, an inventor is also benefited by the search report prepared under the PCT system to be sure that the claimed invention is novel. The inventor could also opt for preliminary examination before filing in other countries to be doubly sure about the patentability of the invention.

Prepared by: Intellectual Property Cell
Courtesy: <http://www.ipindia.nic.in/>

“The term 'Generic drug' refers to any drug marketed under its chemical name without advertising.”



**INTELLECTUAL
PROPERTY INDIA**
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

Instance of a recent controversy on IPR!

Swiss pharmaceutical Co. Novartis attempted to patent anti-leukemia drug Glivec in India. The patent was rejected by Indian Patent Office (IPO) as Glivec was similar to Novartis's earlier version of an beta crystal form of imatinib mesylate (lack of Novelty element) discovered in 1990s. Novartis appealed in Supreme Court of India (SCI) as a high-profile legal battle to conquer Indian market.

India began granting patents for medicines in 2005 when it changed its laws to comply with a global IP agreement, but only for drugs created after 1995. As part of a series of amendments to the Indian Patents Act that took effect on January 1, 2005, the Parliament of India adopted Section 3 (d)*, which was challenged by Novartis to the constitutionality of the provision and to its compatibility with the **World Trade Organization agreement on Trade-Related Aspects of Intellectual Property Rights** and it was rejected by the High Court of Madras in 2007.

While changing its patent rules, India decided to prevent drug companies from getting monopoly protection on updated drugs that did not represent a major advance over previous versions—a practice often referred to as “**evergreening**”. On 1 April 2013, the SCI rendered judgment on the appeal by Novartis against rejection by the IPO of the product patent application for Glivec.

**Section 3 (d): The mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant is not an invention.*

"Such decision should help protect the availability of cheap generic drugs for poor patients while preserving an incentive for true innovation."

COST OF GLIVEC	
Country	Cost in ₹
S Africa	1,74,260
USA*	1,57,920
UK*	1,54,540
India	1,20,000
Brazil	67,420

INDIAN GENERIC DRUGS IN ₹	
NATCO	CIPLA
10,000	9,000

Generic prices range from ₹5,000 to ₹9,000 for a month's treatment
*Government procurement price



3D Printed Skull Implantation: Revolutionizing medical treatments



3D printing is all set to evoke a boom in the medical devices development. A recent testimony to this is the replacement of a skull of a 22 year old lady in Netherlands. She was suffering from a rare bone disease that her skull grows three times thicker than average, putting excess pressure on her brain. She eventually lost vision and impaired motor skills. Many thanks to 3D printing technology, which came as a life saving support for her, in a surgery lasting for 23 hours in University medical center, Utrecht. In the rare surgery, doctors created 3D model of her skull and printed in a plastic implant, were used to replace her heavy skull. The various parts of the plastic implant were attached together with titanium clamps and screws. Medical professionals claim that, previous implants were made within the operating room using a special type of cement, but did not have a very good fit. But implants made with 3D printing could make proper fit and offers a better cure.

In recent years, 3D printing also known as additive printing has been evolving as a game changing technology in which an object is created by laying down successive layers of material such as plastic, ceramics, glass or metal to print an object. Though the technology is in mature state in many mechanical applications, such as component fabrication, prototype development etc, its use in medical industry till today were limited to the making of prosthetic limb, dental fixtures etc. However, active research in medical grade plastics and novel methods in 3D printing makes it to be useful in creating complex structures like human tissues, facial and cranial reconstruction, prosthetic hand, scaffolds

to grow prosthetic ears, knee implants etc. A special kind of a 3D printer called "Bio-Printer" uses "bio ink" made of living cell mixtures to form human tissue. Basically, the bio-ink is used to build a 3D structure of cells, layer by layer, to form tissues. In another application, the 3D printing technology was used to study the details of defects in an infant's heart. Dr Mathew Bramlet, a pediatric cardiologist at Children's Hospital of Illinois in Peoria, used MRI scans for creating a 3D model of an Infants heart who was suffering from a congenital heart defect. He printed the replica of the 9-month-old's heart using a polymer powder and liquid glue which duplicated every detail of the original, including a critical element that an echocardiogram, CT scan and MRI had all missed in their two-dimensional incarnations that deep inside the infant's heart were having many, many more holes. If the 3D printed model is a true replica, a better surgical procedure will be required to bring back the dying heart as otherwise planned. The idea of printing a human kidney or liver in a lab may seem incomprehensible, even creepy. But to many scientists in the field, bio printing holds great promise. "Authentic printed organs could be used for drug or vaccine testing, freeing researchers from less accurate methods such as tests on animals or on synthetic models". And while printing whole human organs for surgical transplants is still years away, the technology is rapidly developing.



(Reported by Sarath S Nair, Chitra High value fellow)

“The limits of the possible can only be defined by going beyond them into the impossible”.



Did you know ???

Padma Shri

Lotus as commonly known, Indian lotus is the most scared and elegant flower. The Lotus grows in fresh water in semitropical climates. It blossoms gradually and admirably - one petal opens at a time and reaches full bloom when the first rays of sun kiss. Its roots are planted deep in the soil of river or pond bottom, while leaves float on water surface, with thick green stems rising above leaves. A lotus has the unique ability to live for a thousand years and can revive into activity after prolonged stasis. In 1994, a seed from a sacred lotus, dated at roughly 1,300 years old \pm 270 years, was successfully germinated.

It has remarkable property to regulate temperature of its flower like that of warm blooded animals. It is the latest discovery in the field of thermoregulation in heat producing plants. Several Australian physiologists have reported that lotus flowers blooming maintained a temperature of 86–95 °F, even when the atmospheric temperature dropped to 50 °F. The lotus genome was sequenced in 2013. Lotus is a panacea for various diseases. Cooked lotus is rich in carbohydrates, water, protein, trace elements and vitamins. The root is often pickled and is an herbal medicine. It cures cardiac complications, stops bleeding, remove toxic wastes and reduces the body heat. It is useful in treatment of small pox, pigmentation, diarrhea and is good for reproductive organs and in the health of growing foetus. In Kerala and Tamil Nadu, its stem is sliced and marinated with salt to dry and used as side dish and is known as "Thamara Vathal". In Myanmar, lotus plant fibres are used to make special robes "*kya thingahn*".

Lotus flower has immense cultural significance in India. The sacred lotus in Hindu belief is considered as a symbol of purity and non-attachment to material world. Most deities in Hinduism and other Asian religion are seated on Lotus flowers. Vishnu and Lakshmi are portrayed in pink lotus iconography while Goddess Saraswati on white. Lord Padmanabha got his name as a lotus flower happens to appear from his navel on which Lord Bhrahma is seated. Lotus is a symbol of divine beauty. In Buddhism, it represents purity of body, mind and speech. It is the national flower of India. Civilian awards like Padma Vibhushan and Padma Shri, are named by Indian Government for distinguished contribution in various sectors. Lotus has many messages for humans. The Bhagavad Gita says, "**One who performs his duty without attachment, surrendering the results onto the Supreme Lord, is unaffected by sinful action, as the lotus leaf is untouched by water.**"

(Contributed by Neelima, PhD student, DTERT)

Quiz 1 winners..

The winners

Aakshi Kalra

Bevin

QUALITY management system logo of the BMT Wing, SCTIMST

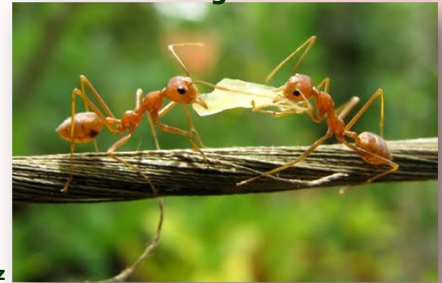


The pictures most liked

Sharing is JOY!



Sunita Chandran & Francis Fernandez



What man encroaches, Nature reclaims!



Almas Shamim



Hullo! Up there, are you OK!



KalliyanaKrishnan V



The wait is long, my dream of you does not end!



Arathi R



Congratulations! Congratulations!



Camera capturing life..

1 Life - a beautiful mystery!



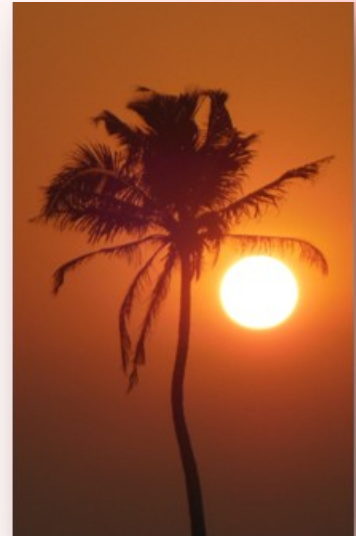
Arulvelan , Asst Prof, NA

5 Union of panchabhutha: fire (sun), water, earth, air, sky



Priyanka S, MPH

Golden shine!



Arathi R, PhD

2 A perfect family evening!



Neethu Mohan, CHVF-D

Fishing nets in air!



Arathi R, PhD

3 Night lark on inspection spree!



Finosh GT, PhD

And miles to go before sleep....



Manoj Komath, Sc E

4 Full moon outshining!



Rohan Thakur, MPH-2013

Lonely rider on moonlight backwaters!



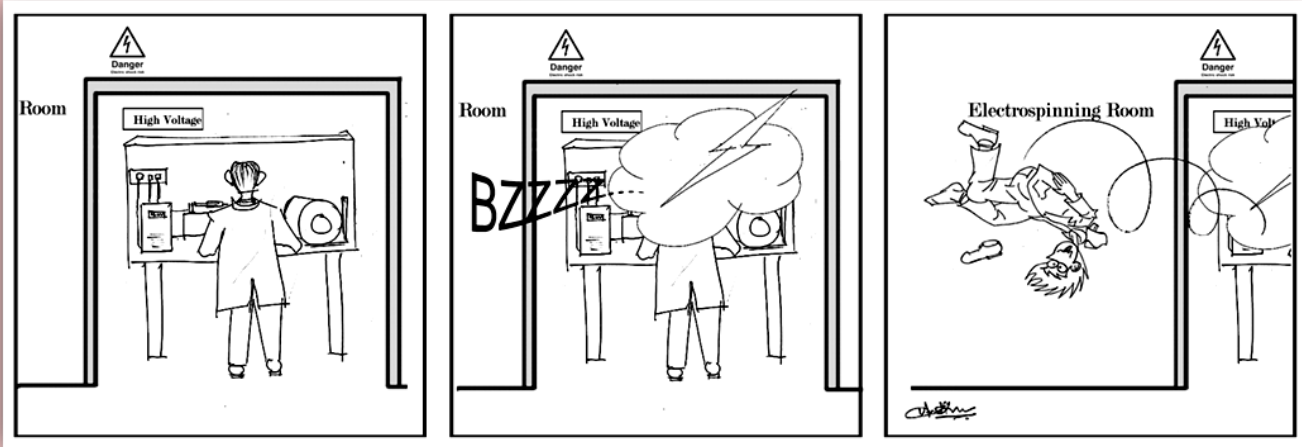
Peeyush, MPH 2014

All these pictures labeled 1-9 are clicked by our talented SCTIMSTians!



Fun Page..

Note: None of the cartoon or its element presented in the e-zine are related to any person, incidence, lab or facility in the Institution. The cartoons are in true spirit of fun and amusement!



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

Photographic competition for Science and General pictures

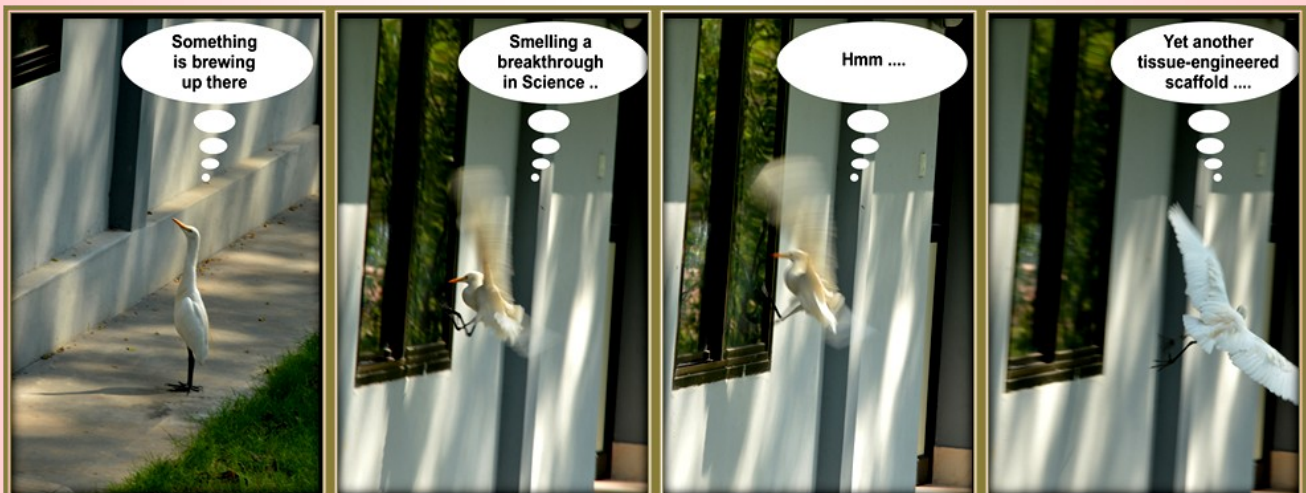
Entries are invited for the pictures competition in science or general category. The pictures should have been clicked by a person who is sending the entry.

Only one entry can be submitted per person

Picture can be coloured or black & white

Last date: August 15, 2014 (Submit at enewsletter@sctimst.ac.in)

Winners of the photographic competition in current issue will be announced in next issue



(Contributed by Dr Manoj K, Bioceramic Lab)



Poetic expressions..

Deception

No truth I'd known holds true; not anymore,
All life's apparently fuelled by lies.
Betrayals too don't turn relations sore
All depends on how well your deeds you hide.
Many lives in the name of privacy
Parallely lived, never crossing paths.
It's the same whether you see or not see
The truth's ignored lest it tears lives apart.
You speak of a trust that needs to exist
It's nothing more than turning a blind eye.
Oblivion's required to subsist
Other's you won't, how much ever you try.
Limitless 'love' you now give and receive
Expecting deceptions, you now deceive.

~Almas Kiran Shamim

Quiz 2



Identify the symbol shown above. What does it signify? Please send your entries to mailbox:

enewsletter@sctimst.ac.in

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

Chitra Tech Recreation Club members on a family cruise to Kochi





Lotus in the BMT campus pool

Patron: Dr Jagan Mohan Tharakan, Director, SCTIMST

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Feedback may kindly be sent to: newsletter@sctimst.ac.in

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

