

SSN COLLEGE OF ENGINEERING

SYNERGY

- Quarterly Newsletter



December Edition
Volume 4, Issue 4



SYNERGY



Special points of interest:

- * Rank Holders
- * Placement details
- * Pacemaker invention is an accident?!
- * Smart Dust -What would it be??

Inside this issue:

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FROM THE EDITORIAL TEAM

The Editorial team wishes you all advance happy, joyous and a prosperous New Year -2016. And here, we bring to you the highlights of human ethical committee formation at SSN in the Department of Biomedical Engineering. The researcher has the primary responsibility for maintaining the highest ethical standards inherent in a culture of research excellence.

This edition also covers the staff's achievements, internal funding sanctioned details for innovative product development, student's scholarship and placement details. And we, the editorial team, promise to bring in the highlights of few BME discoveries to your sight.

We will be back with much bigger achievements of our department on April 2016.

Best Wishes



FACULTY ACTIVITIES

WORKSHOPS



Dr. R. Sivaramakrishnan,



Mrs. K. Nirmala,



Dr. S. Pravin Kumar

- **Dr. R. Sivaramakrishnan, Asso.Prof,** participated in a one day workshop on "Recent Developments in Tissue Engineering", at the Centre for Medical Electronics, Department of ECE, Anna University, Chennai.
- **Dr. R. Sivaramakrishnan, Asso.Prof,** participated in a "Two Day UGC sponsored short term course on New materials, their Characterization and Applications", organized by the Department of Aerospace Engineering, Mechanical Engineering and Crystal Growth Centre, at MIT Campus, Chrompet, Anna University.
- **Dr. R. Sivaramakrishnan, Asso.Prof,** participated in the "Two Day UGC sponsored short term course on Recent Advancements in Biomedical Signal and Image Processing", organized by the Department of Electronics Engineering, MIT Campus, Chrompet, Anna University.
- **Mrs. K. Nirmala, Asst.Prof.** Participated in the "Two Day UGC sponsored short term course on Recent Advancements in Biomedical Signal and Image Processing", organized by the Department of Electronics Engineering, MIT Campus, Chrompet, Anna University.
- **Dr. S. Pravin Kumar, Asso.Prof,** participated in workshop on "Internet of Things" organized by Department of ECE, SSN College of Engineering
- **Dr. S. Pravin Kumar, Asso. Prof** participated in a "Short Term Training Program On Biomedical Diagnostics, Therapeutics And Rehabilitation" at IIT Madras.

TECHNICAL TALK

- **Dr. V .Mahesh, Asso.Prof, Dr. S .Pravin kumar, Asso.Prof. And Mrs. B. Geethanjali, Asst.Prof,** organized a technical talk and demonstration by Mr. Saravanan, SMK IMI, Chennai on "Multi Channel Wireless Telemetry System" to IEEE EMBS student



Mr. Saravanan giving a demo on Multi Channel Wireless



Mr.Dinesh interacting with I-P.G students

Dr. V .Mahesh, Asso.Prof, Dr. S .Pravin kumar, Asso.Prof. and Mrs. B. Geethanjali, Asst.Prof, organized a technical talk and demonstration by Mr. Dinesh, Helix Corporation, Bangalore on "Fluke Electrical safety and diathermy Analyzer" for M.E- I year students

PAPER PUBLICATIONS:

- **Nithya, R., & Venkateswaran, N** published a paper on Analysis of Segmentation Algorithms in Colour Fundus and OCT Images for Glaucoma Detection in Indian Journal of Science and Technology, 8(24). doi:10.17485/ijst/2015/v8i24/80151
- **R. Yuvaraj** published a paper on Brain functional connectivity patterns for emotional state classification in Parkinson's disease patients without dementia, Brain Behavior Research, 2015, (IF = 3.028) – In press. doi:10.1016/j.bbr.2015.10.036
- Sumathi K and **Mahesh Veezhinathan**, published a paper on Total Variation Based Edge Enhancement for Level Set Segmentation of Intima-Media Layer in Carotid Arteries and analysis of shape based features, in The International Multi-Conference on Engineering and Technology Innovation 2015 (IMETI2015)
- Pramila PV and **Mahesh Veezhinathan** published a paper on Multivariate Adaptive Regression Splines Based Prediction of Peak Expiratory Flow with Spirometric Data in The International Multi-Conference on Engineering and Technology Innovation 2015 (IMETI2015)
- E. Priya & **Mallika Jainu**, "Adverse Effects Of Combinatorial Therapy Of Vildagliptin And Insulin On Cardiac Tissues In Diabetic Rats ". Indian Journal of Science & Technology. 8(32): Dec 2015



Ms.Nithya, R



Dr. R. Yuvaraj



Dr.V.Mahesh



Dr. Mallika Jainu

ETHICAL COMMITTEE MEETING

The department of Biomedical Engineering conducted an ethical committee meeting for Biomedical Engineering at BME conference hall. The members of the Ethical Committee are



Panel Members of IEC

- **Dr. A. Ruckmani**, Professor & HOD, Department of Pharmacology, Chettinad academy of Research and Education. (*Chair person*)
- **Dr. S. Salivahanan**, Head of the Institution,SSCNE (*Internal Member*)
- **Dr. P. Ramasamy**, Dean Research, SSNCE. (*Internal Member*)
- **Dr. A. Kavitha**, Associate Professor & Head, Department of Biomedical Engineering, SSNCE. (*Internal Member*)
- **Dr. R. Yuvaraj**, Associate Professor, Department of Biomedical Engineering, SSNCE. (*Member secretary*)
- **D. Kumar**, M.A., M.L., Advocate, High court, Chennai.(*Lawyer (legal expert)*)
- **Mr. P. ShanmugaSundaram**, Child Care Foundation.(*One representative of non-governmental voluntary agency.*)
- **Dr.S.Paneerselvam**, Professor & Head, Department of Philosophy, University of Madras.(*One philosopher / ethicist / theologian*)
- **Ms.Niranjani**, Asst.Prof. Dept of Geography, Tourism and Travel Management, Madras Christian College. (*One Lay-person from the community*)

The programme was co-ordinated by **Dr.R.Yuvaraj**, Asso.Prof-BME

Why Human Ethical

Committee??

Role of Institutional Ethical Committee (IEC): Our IEC will review and approve all types of research proposals involving human participants with a view to safeguard the dignity, rights, safety and well-being of all actual and potential research participants. The goals of research, however important, should never be permitted to override the health and well-being of the research subjects.

OTHER ACTIVITIES

- **Dr. Mallika Jainu** had a discussion with V. Sathyamoorthi, R& D Department, Life Cell International (P) Ltd. regarding the stem cell training program. This training program would provide the best opportunity for the interested to pursue their research career with stem cell biology.
- **Dr.V.Mahesh** was actively volunteering in Chennai Silver Lining - Sanitation Drive to help the flood victims.
- **Dr. Mallika Jainu** attended Ph.D thesis submission meeting for her Ph.D scholar E. Priya at Bharathiyar University, Coimbatore on 29-11-2015.
- **Dr. Mallika Jainu & S.K. Mohan** received "Prof. Satyanarayana award" from Association of Pharmaceutical Teachers of India for the best research work done in Pharmacology area at APTICON -2015, Madhya Pradesh

STUDENT ACTIVITIES

INTERNAL FUNDING

Students Name	Guided by	Title
M. Kiruthiga, S. KeerthanaPriya, S. Bhavatharani	Dr. S. Pravin Kumar	An armed wearable device for cuff-less blood pressure measurement
R. Lekha, S. Thariga, G. Ranjitha, M. Shanthini	Dr. S. Pravin Kumar	Enzyme based glucose analyzer using spectrometer technique
AtulTaneja, S. Susmitha, B. Tanushree Devi, S. B. Vishal	Dr. R. Subashini, Dr. S. Pravin Kumar	Urea and creatinine monitor
AathiraHaridas, M. Keerthana, V. Ritu	Dr. S. Pravin Kumar Dr. V. Mahesh	Non-invasive glucometer
M. Vaidhav, R. Gopichandran, D. Suryaprakash	Dr. V. Mahesh	Low cost Dialysis Machine
S.B. Vishal, Arjun Anil Kumar	Dr. V. Mahesh, Dr. R. Subashini	Syringe destroyer
Y. Ahila, S. Nivethithaa, N. Roshini; P. Prabanjan	Ms. R. Nithya Ms. Dhanalakshimi	Design and development of mobility aid for physically challenged people

"Don't take rest after your first victory because if you fail in second, more lips are waiting to say that your first victory was just luck." -
A.P.J Abdul Kalam

PLACEMENT



1. Nandini T
2. Archana S
3. Banu Saranya
4. Dinesh Kumar Reddy



1. Haritha S
2. Bhavana



1. Abhinaya P
2. Abisha Priyamini
3. Akshaya Kirithy
4. Alagu Ganesh
5. Geethapriya
6. Imaiyan CR
7. Jothilakshmi A
8. Manivhannan
9. Mohammed Ikram
10. Muthumeenakshi



1. Alagu Ganesh
2. Akshaya Kirithy
3. Geethapriya
4. Ragavi SR



1. Ibrahim Asif Ali
2. Pooja C
3. Subiksha Sureender
4. Deepak Dennison



1. Shreenidhi Shivkumar
2. Shrisha Manogaran



1. Alagu Ganesh
2. Imaiyan CR
3. Manivhannan
4. Muthumeenakshi
5. Ragavi SR
6. Selvapriya
7. Sri Smruthi
8. M Sruthi



1. Abhinaya P
2. Abisha Priyamini
3. Madhumathi
4. Manivhannan
5. Muthumeenakshi
6. Pavithra M
7. Ragavi SR
8. Safeena Yasmin
9. Shraddha Srinivasan
10. Sri Smruthi
11. M Sruthi
12. Subashine A



1. Alagu Ganesh
2. Geethapriya
3. Loganathan V
4. Muthumeenakshi
5. Pavithra M
6. Ragavi SR
7. Santhanakrishnan
8. Shilpa Ananth
9. Shraddha Menon
10. Shraddha Srinivasan
11. Sri Smruthi
12. M Sruthi
13. Subashine A
14. Sushmitha B
15. Vallabhi Venkatesh
16. Varsha Mohan
17. Vijayalakshmi R

"If you want to
shine like a sun.
First burn like a
sun." - A.P.J
Abdul Kalam

RANK HOLDERS

1. Bhattaram Sneha Priya - 2nd Rank
2. Gayathri R.S - 4th Rank
3. Dheepashri.K -6th Rank
4. Swathi.S - 8th Rank
- 5.Aarthi.R- 9th Rank
6. Yuvadharshini.I -10th Rank
7. Divyalakshmi.S - 11th Rank
8. Deepika.S -14th Rank
9. Vinudha.S - 17th Rank
10. Srinidhi.G- 18th Rank
11. Vardhini.P - 19th Rank

B. Sneha Priya



R.S. Gayathri



K.Dheepashri



MERIT SCHOLARSHIP:

II YEAR

Manasavi.S

Bhargavi.K

AnuradhaLakshman

III YEAR

Atul Taneja

Tanushree Devi.B

Sushmitha.S

IV YEAR

Nandhini.T

Archana.S

Sruthi.M

"All of us do not have equal talent. But , all of us have an equal opportunity to develop our talents."
- A.P.J Abdul Kalam

OTHER ACTIVITIES

- 3rd and 4th year BME students collected Rs. 10,000 and **donated to flood victims** as Bed sheet, sarees, dhoti etc...
- **Meenachi. P**, presented her paper titled Study of Hydroxyapatite on 316L Stainless Steel By Electrophoretic Deposition Method, DST-SERB in the **Two Days National Conference on Biomaterials in Medicinal Chemistry, Madurai Kamaraj University** at 21st& 22nd of December 2015.

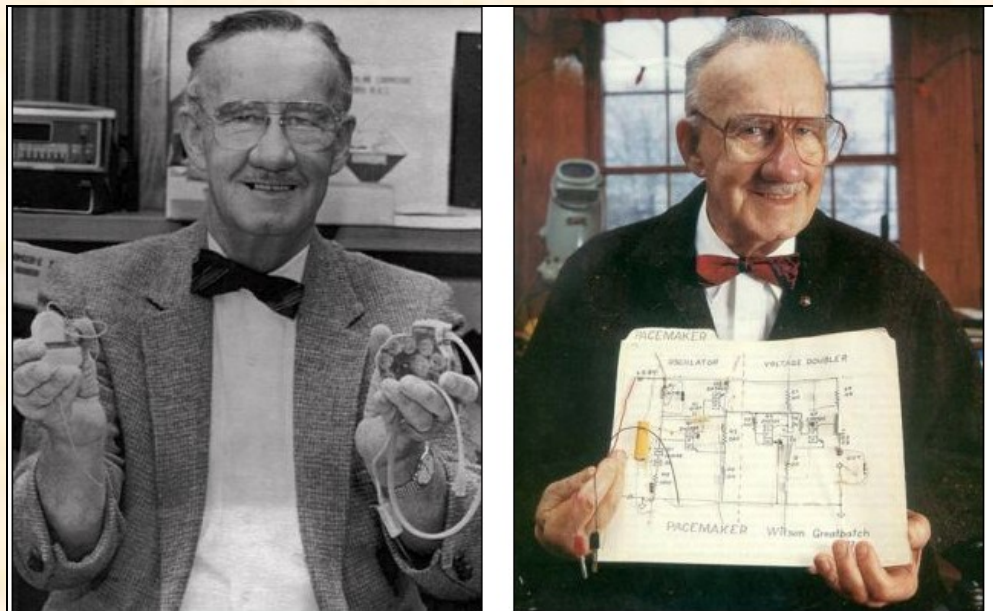
ACCIDENTAL DISCOVERIES

THE PACEMAKER

Wilson Greatbatch has died at the age of 92. He was a lifelong inventor. And like many inventors, his most notable creation, the implantable cardiac pacemaker, was discovered accidentally.

In the 1950s, Greatbatch had left the Navy and was working as medical researcher, Chronic Disease Research Institute. He was building an oscillator to record heart sounds when he pulled the wrong resistor out of a box. When he assembled his device, it began to give off a rhythmic electrical pulse. Instead of recording heartbeats as Greatbatch had planned, the device started to send out pulses. It was then he realized his invention could be used as a pacemaker. He spent two years refining his device and was awarded a patent for world's first implantable pacemaker

A pacemaker is a small device that's placed in the chest or abdomen to help control abnormal heart rhythms. This device uses low-energy electrical pulses to prompt the heart to beat at a normal rate.



Life-long work: Mr Greatbatch shows off his new invention in the early Sixties, above left, while later he shows off the simple design that started it all - his patent for the pacemaker

Before then, pacemakers were the size of a TV and shocked patients during use, so you can imagine how an implantable device would change people's lives. His first pacemaker was implanted in a 77-year-old patient who lived 18 months with the device. In 1985, his pacemaker was recognized as one of the ten greatest engineering achievements of the last 50 years by the National Society of Professional Engineers.

As pacemakers improved, Greatbatch was increasingly frustrated with battery technology and the limitations it imposed. In the early 70s, he left the world of pacemakers and began manufacturing lithium batteries. His company, Greatbatch, Inc, eventually supplied 90% of the world's pacemaker batteries.

In his latter years, Greatbatch turned his passion towards the environment, AIDs research and educating the future generation. He was known for his inventor's spirit which never gave up on a project, even after repeated failures. His persistence paid off. When he died, he held over 150 patents.

Pacemaker- Timeline

1899: J.A. McWilliam reports in British Medical Journal of his experiments, using an electrical impulse on a human heart in asystole to cause a ventricular contraction, and that a 'heartbeat' could be evoked by impulses applied at spacings equal to 60-70/minute.

1926: Dr Mark C Lidwell of the Royal Prince Alfred Hospital of Sydney, Australia, and Edgar H Booth of the University of Sydney, construct a portable heart apparatus that can be 'plugged into a lighting point', with a variable rate of 80 to 120 pulses per minute.

1932: U.S. physiologist Albert Hyman coins the term 'artificial pacemaker', describing his electro-mechanical instrument, powered by a spring-wound hand-cranked motor.

1950: External pacemaker designed and built by the Canadian electrical engineer John Hopps, based upon observations by cardio-thoracic surgeon Wilfred Gordon Bigelow at Toronto General Hospital.

1956: Development of the silicon transistor, a pivotal event that led to rapid development of practical cardiac pacemaking.

1958: Wilson Greatbatch granted patent for first implantable pacemaker; Arne Larsson given the first implantable pacemaker in Sweden.

April 1960: Greatbatch pacemakers implanted in multiple humans from April 1960. The Greatbatch innovation varied from the earlier Swedish devices in using primary cells (mercury battery) as the energy source. st patient lived for a further 18 months.

A pacemaker consists of a battery, a computerized generator, and wires with sensors called electrodes on one end. The electrodes detect your heart's electrical activity and send data through the wires to the computer in the generator. If your heart rhythm is abnormal, the computer will direct the generator to send electrical pulses to your heart. The pulses then travel through the wires to reach your heart

SMART DUST

Jamie Link was a Chemistry graduate student at the University of California, San Diego. Link was in the process of making a thin multi-layer film of porous silicon on a crystalline substrate when the silicon chip accidentally broke. She then observed that each piece—her smart dust—retained the properties of the original. When the chip shattered, she discovered (with the help of her professor) that the tiny bits of the chip were still sending signals, operating as tiny sensors. They coined the term "smart dust" for the small, self-assembling particles. The particles have been found to have a wide range of uses in medical diagnostics and research, environmental testing, drug delivery and countless other uses. Smart dust has a myriad of potential applications and plays a large role in attacking and destroying tumors. For instance, Link can make her particles a particular color, then program them to detect a particular substance, such as a toxin. As the microscopic sensors find the toxin, they join together as a red spot to mark the toxic pollutant. The invention could have wide commercial use in research and medical laboratories—in performing rapid biochemical assays, screening chemicals for potential new drugs and testing air and water for toxic chemicals

"The essence of the independent mind lies not in what it thinks, but in how it thinks."

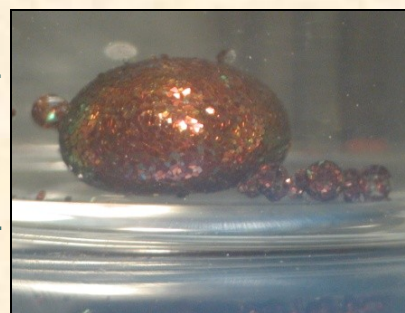
— Christopher Hitchens

TARGETED SMART DUST -HOW IT WORKS:

In order to spontaneously assemble and orient the micron-sized porous Si "smart dust," we couple chemical modification with the electrochemical machining process used to prepare the nanostructures. The process involves two steps, see the scheme below. In the first step, a porous photonic structure is produced by etching silicon with an electrochemical machining process. This step imparts a highly reflective and specific color-code to the material, that acts like an address, or identifying bar-code for the particles. The second step involves chemically modifying the porous silicon photonic structure so that it will find and stick to the desired target.

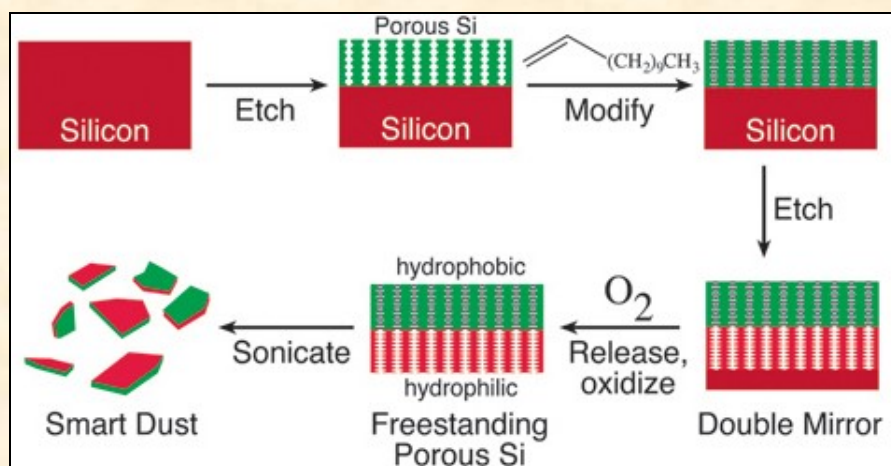


Jamie Link



Smart Dust

In the present case, we use chemistry that will target the interface between a drop of oil in water, but we hope to be able to apply the methodology to pollution particles, pathogenic bacteria, and cancer cells. The two steps (etch and modify) are repeated with a different color and a different chemistry, yielding two-sided films. The films are broken up into particles about the size of a human hair. With the chemistry shown below, the particles seek out and attach themselves to an oil drop, presenting their red surface to the outside world and their green surface towards the inside of the drop.



Once they find the interface for which they were programmed, the individual mirrored particles begin to line up, or "tile" themselves on the surface of the target. As an individual, each particle is too small for one to observe the color code. However, when they tile at the interface, the optical properties of the ensemble combine to give a mirror whose characteristic color is easily observed. This collective behavior provides a means of amplifying the molecular recognition event that occurs at the surface of each individual particle. As a means of signaling their presence at the interface, the particles change color. As the nanostructure comes in contact with the oil drop, some of the liquid from the target is absorbed into it. The liquid only wicks into the regions of the nanostructure that have been modified with the appropriate chemistry. The presence of the liquid in the nanostructure causes a predictable change in the color code, signaling to the outside observer that the correct target has been located. This work was first reported in J. R. Link, and M. J. Sailor, Proc. Nat Acad. Sci. 2003 100, 10607-10610.

"Critical thinking is thinking about your thinking while you're thinking in order to make your thinking better."

— Richard W.

UPCOMING EVENTS

1. ICMR sponsored National Conference on Advancements in Biomedical Engineering and Sciences 2016, BME Dept/SSNCE on 3rd -4th March 2016. Last date for Paper submission is extended to : 31st Jan 2016 <http://ncabes2016.wix.com/ncabes>
2. IEEE International Conference on Human Computer Interactions (ICHCI'16), on 10-11 March 2016 at Saveetha University . <http://www.ichci16.com/index.php>
3. Project Competition Kompyooter, Chennai, Tamil Nadu, January 24 2016
4. IEEE 3rd International Conference on Electronics and Communication Systems ICECS 2016, Karpagam College of Engineering, Coimbatore, Tamil Nadu, February 25-26 2016
5. International Workshop on Secure Android Coding & Testing IWSACT'15, Coimbatore Institute of Technology, Tamil Nadu, February 28 2016
6. Epiphany 2k16, Sri Krishna College of Engineering and Technology, Coimbatore, Technical Symposium, Tamil Nadu, January 28-29 2016

Learning is not attained by chance, it must be sought for with ardor and attended to with diligence.
- Abigail Adams


**National Conference on
Advancements in Biomedical
Engineering and Sciences
(NCABES -2016)
3rd-4th March 2016**



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SSN COLLEGE OF ENGINEERING
RAJIV GANDHI SALAI (OMR)
KALAYAKKAM - 603 110
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**2nd IEEE INTERNATIONAL
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Venue: Saveetha University
Thandalem Campus

Department of CSE/IT & ECE,
Saveetha School of Engineering,
Saveetha University, Chennai - 602 105,
Tamil Nadu, India.
Phone: +91 44 6672 6662, Ex. 3031, 3034
Email: convenorichci@gmail.com



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