

SYNERGY

LEAVE NOTHING TO CHANCE



DEPARTMENT OF BIOMEDICAL ENGINEERING



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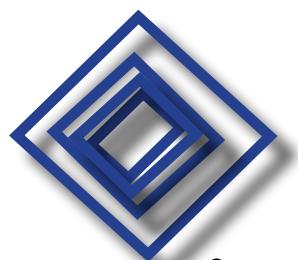
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EDITOR'S DESK

Welcome,

We are extremely happy to present the fifth edition of the seventh volume of Synergy.

This edition brings out many spotlight events of the department. It also gives an insight in to the exciting and interesting inventions in the field of Biomedical Engineering.

We congratulate our fellow mates for their achievements. The making of this edition was a great experience. We would like to thank everyone who helped us on bringing out this edition with suitable contents, images etc.. We also thank the institution for giving us consistent support on all our endeavours. Let's make the journey of learning more better, more creative.

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HOD'S DESK



Dr. A. KAVITHA
Prof. & Head
Dept. of BME

It is a feeling of immense pleasure to once again put our heads together in releasing the next issue of our newsletter-SYNERGY. This volume brings out the campus updates and various events and activities organised by the department during January 2019 to March 2019.

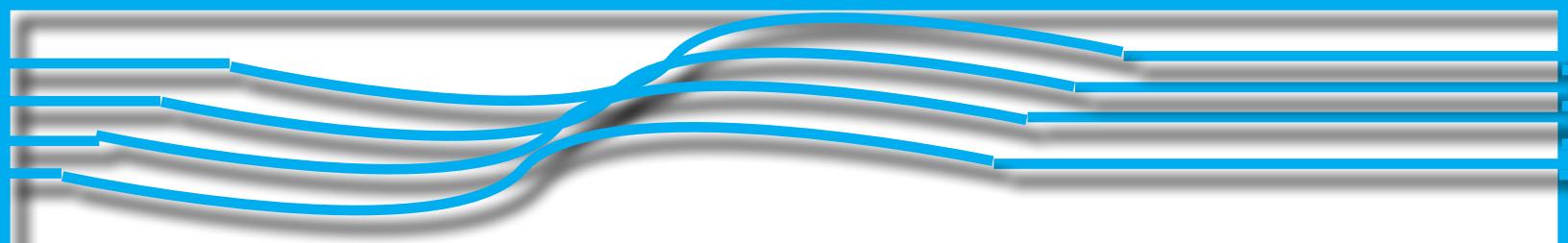
It also showcases the achievements of the students in various fields. I congratulate all the students for their accomplishments. I would like to thank all the faculty members for their seamless contribution to the department's growth and guiding the students to achieve their goals. Let's together continue to raise the glory of the department and make it a euphoric journey!

CAMPUS ACTIVITIES

SSN ANNUAL ALUMNI MEET

SSN believes in fostering a strong alumni network that not only helps former students remain connected but also provide an avenue for the philanthropic spirit of successful alumni. The Alumni Association provides a platform for sharing ones intellectual, cultural, career and professional experiences not just with the present students but also with other alumni. This year's Alumni meet-TRIBUTE 2019 was held on 5th January, 2019, was yet again an occasion of togetherness and pride!





PRESIDENT STUDENT MEET

The meet with the President, Ms. Kala Vijaykumar, SSN College of Engineering, was held at the Department of Biomedical engineering on the 18th of January, 2019 at 12:00 noon. This is an annual meet by the President of the institution with the students discussing various developments and improvements that can be brought about within the institution for its betterment.

The following points were discussed:

- Discussion on the requirement of BME companies to recruit interns from the 3rd year
- Discussion on the requirement of more biomedical core companies for recruitment.
- Discussion on the requirement of an electronic shop in the campus.
- Discussion for an online library facility
- Discussion regarding a dedicated system within each department for skype connections with the alumni.
- Discussion regarding the functionality of reprography in the BME department.

Various other points were discussed.

The meeting was concluded with the note that appropriate steps would be taken against the posed requests.

PHILANTHROPIST OF THE YEAR 2018 - DR.SHIV NADAR

- Indian IT pioneer Dr.Shiv Nadar cofounded HCL in a garage in 1976 to make calculators and microprocessors.
- Today, he chairs HCL Technologies, an \$8.2 billion (revenue) company that is India's fourth-largest software services provider.
- In December 2018, HCL Technologies agreed to buy some software products from IBM for \$1.8 billion.
- HCL Technologies, which employs close to 128,000 people worldwide, hires high school grads and trains them on the job.
- One of India's leading philanthropists, Dr.Shiv Nadar has donated \$662 million to his Shiv Nadar Foundation, which backs education-related causes.



Dr. SHIV NADAR

INNOVATION DAY

SSN Celebrated its first Innovation Day on Feb 8th, 2019. Dr.Ashok Jhunjunwala, Institute Professor at IIT Madras,Chennai was the Chief Guest of the program and addressed the gathering. Around 32 carefully selected project teams displayed the innovative projects and over 50 representatives from leading companies evaluated the projects and gave their valuable suggestions to commercialize the same.

About SSN Innovation Centre:

Inaugurated by Dr.Shiv Nadar, Founder, SSN Institution in 2016. It has been conceived as a space for students to work on Innovative ideas and projects with the theme: Walk in with an idea,Walk out with a product. Till date, students at the innovation Centre have developed over 50 innovative projects and 11 patents have been filed from these projects. All these projects have been seed funded by SSN Trust on average of Rs.20,000 per project.

The following project were displayed on innovation day from BME department:

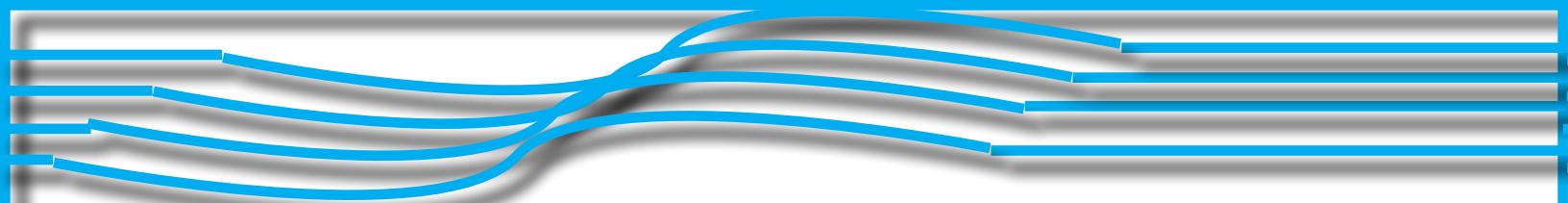
1. Viswath Narayanan.R and Yaamini.D,students of final year BME displayed project titled “Analysis of Cognitive Attention in Autism using Virtual Reality learning tool”.
2. Viswanath.S and Apurva.S,students of final year BME displayed project titled “Orthopedic belt using sodium acetate crystals”.

3. Arunkumar.K and Pavithran P G, students of final year BME displayed project titled “Design and Development of Command prompt assist device for Locked-in syndrome patients”.
4. Praveen kumar.G, Sangeetha.B, Om Prakash.S and Asha.R, students of final year BME displayed project titled “ Design and Development of Non-invasive electrogastrography acquisition setup for gastric oddities detection”.

The project titled ‘Orthopedic belt using sodium acetate crystals’ done by Viswanath S and Apurva S final year BME, supervised by Dr. R. Subashini, Asso.Prof/BME won the first prize among 32 projects displayed for the innovation day.



Students exhibiting their projects on the occasion
of Innovation Day



INSTINCTS

The most expected event in the calendar - Instincts '19 took place at the college from the 7th of March to the 9th of March 2019. The college was buzzing with activities and competitions. The talents of the students - in music,dance,theatre, gaming etc - were put to the test. The culturals kicked off on the 7th by actor-cum-music director GV Prakash and Raiza Wilson. Harish Kalyan presided over the Annual Magazine release by the Saaral Tamizh Mandram. Dheena, Naveen, Sathish of Kalakka Povathu Yaaru fame had the students in splits during their performance in the variety show. After the packed schedule on the opening day, the students were treated to a mesmerising concert by the famous band, Thaikkudam Bridge.

The second day was highlighted by the event,Reels of fire - in which aspiring directors showcased their short films to the distinguished panel of judges which comprised of Elan (of Pyar Prema Kadhal fame), Rajesh M Selva (of Kadaram Kondan fame), Nelson Venkatesan (of Oru Naal Koothu fame). The short film Sila Pengalin Kadhai directed by Sriram KJS bagged the first prize. The second day drew to a close with Choreo Nite - the hunt for the best dance crew among various colleges.

The third day kicked off with a Tamizh debate presided by the renowned moderator Sukhi Sivan. The showcase event of the SMC - The SSN idol and a fierce performance by the silambal artists from Saaral were other notable events that took place. The curtains were drawn on the 3 day festival with the DJ Night where the students shook a leg to the modern day party hits.

Instincts 2019.....



GRADUATION DAY

One of the premier and preferred institutes in Tamil Nadu for technical and management education-SSN College of Engineering, conducted its Nineteenth Graduation Day on March 17th, 2019. Prof P. Balaram, Former Director IISc, Bangalore was the chief guest for the occasion, awarded medals and certificates to the graduands. In the year 2017 – 2018, 832 -UG, 94 - M.E. / M.TECH, and 116- MBA (a total of 1042) students graduated with flying colors. The graduated batch has 112 University rank holders which includes 1 gold medalist from B.E./ B.Tech. and 3 from M.E / M.Tech respectively. In 2018, around 187 top notch companies visited the campus. The prominent companies that visited the campus included Facebook, Google, Apple, Amazon, and HCL Facebook and Apple made the highest offers of Rs.102 LPA and Rs. 92.00 LPA respectively (in terms of CTC). It is to be noted that the college has secured a placement record of more than 93% during the last 10 years and around 25% of students are pursuing higher education abroad in renowned Universities such as Harvard University, Oxford University, Stanford University , Cornell, Carnegie Mellon, National University of Singapore, Arizona State University and Florida International University.



SIH 2019

The World's Biggest Hackathon- Smart India Hackathon 2019. SSN proudly hosted the mega open innovation model on March 02, & 03, 2019. 35 top teams across the country participated at SSN solving problem statements from the Ministry of Agriculture, ICAR and Ministry of Water Resources. The grand finale was inaugurated by Thiru.V.Shankar, Founder, Computer Age Management Services Pvt. Ltd.(CAMS).

Valedictory function of the grand finale of SIH 2019 held at SSN College of Engineering. SSN acted as one of the nodal centres for SIH 2019 in the country. 8 teams were declared winners at SSN for their of idea of solving problem statements from the Ministry of Agriculture, ICAR and Ministry of Water Resources. SSN congratulates all the participants from various colleges for their enthusiasm and efforts in this 36 hours open innovation model.



Winners of SIH 2019 in SSN

SPORTS DAY

The 20th Annual Sports day of SSN College of engineering was held on the 15th of March, 2019. The occasion was graced by SHRI.KARN SHARMA,International cricketer to enlighten the athletic minds and distribute prizes and medals. The winners of various tournaments like intra college meet ,etc., were awarded.



SSN sports team(third year) receiving overall trophy from Karn Sharma



The Chess team receiving the award

COLLEGE DAY CELEBRATIONS

The 23rd college day celebrations was held at the Justice Pratap Singh auditorium, SSN campus on the 15th March,2019 at 2:00 pm. MR.V.Vishnu, IAS, Executive Director, Tamilnadu Skill Development Corporation was the chief guest. The occassion kick-started with the welcome address followed by the presentation of the college report by the Principal. The various department reports were presented by the respective student secretaries. The meritorious students were then presented with medals and certificates. The following students of Biomedical Department were felicitated for their academic performance:

Final year:

- 1.Arun Kumar
- 2.Kirthana
- 3.Sucharitha Prakash
- 4.Sangeetha

Prefinal year:

- 1.Lindhiya.L.An
- 2.Kavya.V.Kannan
- 3.Sandhanakrishnan.R

Second year:

- 1.Pranav Krishna.R
- 2.Gurucharan.M.K
- 3.Srinithi.R



Student of third year BME receiving the award

MELA 2019

SSN College of Engineering is conducting its annual student market extraordinaire, MELA, on 7th February, 2019. A platform to display your sharp entrepreneurial skills. Mela is a platform where hundreds of students visit stalls with food, games, wares, photography and beyond, and this is the place to set up your micro business for a day. A way to break the monotony of academia and indulge in a day of absolute fun. Mela promises you an entire day of unrestrained joy and multiple ways to spend your time. The perfect place to satisfy the gamer, gourmet and shopper in you, especially with a student budget.



Stalls exhibited during MELA 2019

DEPARTMENT VENTURES

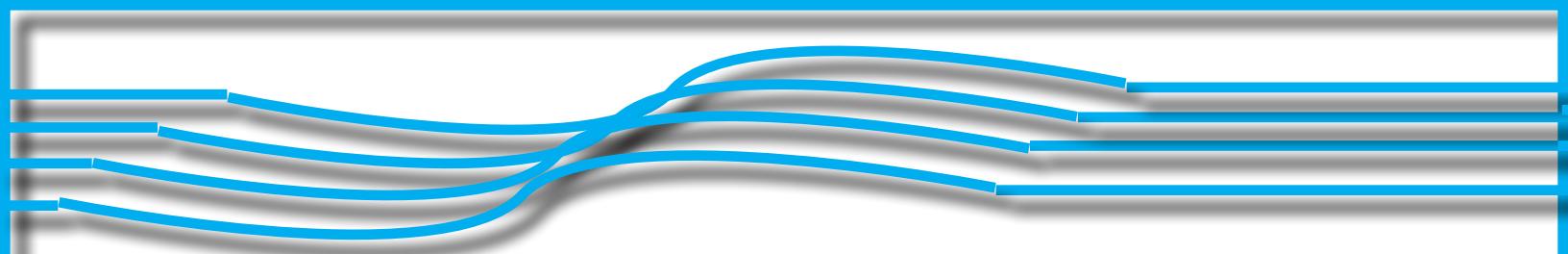
ICBSII 2019

The Department of Biomedical Engineering organized Fifth International Conference on Biosignals, Images and Instrumentation (ICBSII 2019) . Dr. Mamun Bin Ibne Reaz, Universiti Kebangsaan Malaysia has inaugurated the event and the speakers from various institutions had delivered session talks during the conference.

About 75 delegates from various institutions had presented the technical papers under Oral and poster category. Dr. J. Vijay Asso.Prof/BME, Dr. S. Arun karthick Asso.Prof/BME and Dr. K. Nirmala Asso.Prof/BME co-ordinated the programme with Dr. A. Kavitha Prof/Head, Convenor, ICBSII 2019

List of keynote speakers who delivered their talk during ICBSII 2019:

- **Dr. K. Ganapathy**, Director, Apollo Telemedicine Networking Foundation, Apollo Hospital, Chennai delivered a talk on “Technology Enabled Remote Health Care”.
- **Dr. Sudhir Ganesan**, Ortho Surgeon, SRIHER, Chennai delivered a talk on “The Prospects Of Engineering In Medicine – A Surgeon’s Perspective”.
- **Dr. Gowrishankar**, Anaesthesiologist, Stanley Medical College, Chennai delivered a talk on “Technology in Anaesthesiology and Critical Care”.

- 
- **Dr. Neelesh Kumar**, Principal Scientist Biomedical Instrumentation Unit, CSIR-CSIO, Chandigarh delivered a talk on “Development of Indigenous Medical Technologies: CSIR-CSIO Perspective”.
 - **Dr. Dipanjan Roy**, Scientist, Cognitive Brain Dynamics lab, National Brain Research Centre (NBRC) delivered a talk on “The large scale brain connectivity and lifespan trajectory of neural oscillatory activity in the motor system”.
 - **Dr.Md Mamun Bin Ibne Reaz** Professor, Centre of Advanced Electronic and Communication Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia delivered a talk on “A Capacitive Electromyography Sensor for Extramural monitoring of Muscle Activity”.
 - **Dr. S. Kanagaraj**, Professor, Biomedical Devices and Biomaterials laboratory, Department of Mechanical Engineering, Indian Institute of Technology, Guwahati delivered a talk on “Development of UHMWPE based next generation load bearing nanocomposites using a novel manufacturing technique for total joint replacements and testing them in an ingeniously developed hip joint wear simulator”
 - **Dr. Justin Dauwels**, Associate Professor, Deputy Director of STE-NTU Corporate Laboratory, School of Electrical and Electronics Engineering, Nanyang Technological University, Singapore delivered a talk on “Artificial Intelligence For Applications In Neurology”.

A GLIMPSE OF ICBSII 2019



Dr.A.Kavitha felicitating Dr.Salivahanan(Principal, SSNCE) at the inaugural of ICBSII 2019



A group photo with the speakers,HOD-BME, Faculty members of BME and the participants



Release of the Biomedical Department's Brochure



Faculty members, BME at ICBSII 2019



Dr.Justin Dauwels, AP of STE-NTU Corporate Laboratory presenting his talk



A group photo with the Chief guest, HOD-BME, Faculty members of BME,Volunteers and performers during the cultural night



A participant presenting her paper

A KIND GESTURE IN RETURN...FROM OUR CHIEF GUEST

- **Dr. Mamun Bin Ibne Reaz**, Professor, Centre of Advanced Electronic and Communication Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia

I have been to few colleges around in India for last one year and I will say that SSN is one of the best. I was wondering how SSN maintain its clean and beautiful outlook. I managed to talk with the students and also academic staffs. In my opinion, SSN has a good selection process of students. They are bright, knowledgeable, and lastly they know how to behave and respect. Academic staffs are also so cordial, knowledgeable in their respective fields.

While going through the poster session, I was amazed of knowing the innovative ideas of students and they are really good in terms of their respective research. This not only shows the merit of student, it also shows the depth of supervisions. The conference was excellent. The selection of speakers were perfect. However, having such resources, I was expecting a number of foreign delegates especially from Europe and USA. I believe you could not get sufficient time to promote this conference worldwide. But I can see the prospect and I am sure you will focus promoting this conference worldwide, which will enhance the reputation of SSN beyond India. I should also mention about the stage performance of the students, I initially thought that SSN has hired the performers but after knowing that the performers are also the present students, I was speechless.

Lastly, I am honored to be there and your unparallel and excellent hospitality can not be expressed in words. I sincerely wish for SSN to be an world-class institute.

Thanks and regards,
Prof. Dr. Md. Mamun Bin Ibne Reaz

COIMBATORE SCIENCE TECHNICAL FESTIVAL 2019

Viswanath S and Praveen kumar G, final year biomedical students under the guidance of Ms.M.Dhanalakshmi, AP/BME from SSN College of Engineering has exhibited their project work “Chin up” in Coimbatore science technical festival 2019 - first edition and won the runner-up trophy. It was organized under the brand name Coimbatore Vizha on 6th and 7th of January 2019. The team was rewarded with a cash prize of Rs. 20,000/- and stood top among innovative projects all over Tamil nadu.



Praveen Kumar and Viswanath along with their guide Ms.Dhanalakshmi, AP/BME presenting the project (left), receiving a cash prize of Rs.20,000/-

INNOVATION DAY 2019

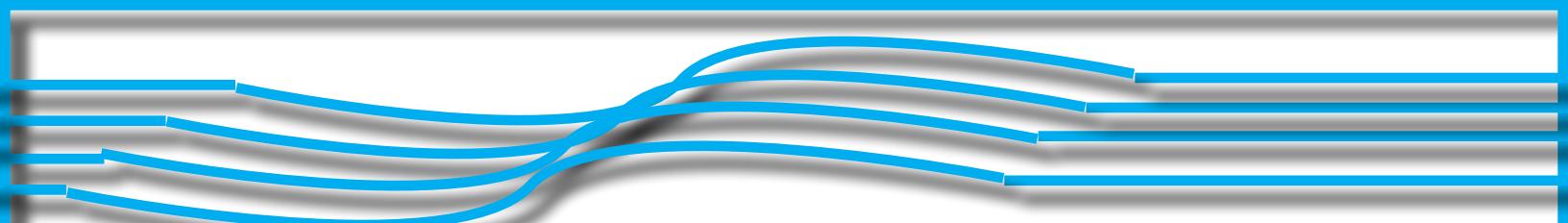
We are proud that our Biomedical team comprising Viswanath.S and Apurva.S under the guidance of Dr.R.Subashini had won First place and received cash award of Rs. 5000/- from our beloved President Dr. Kala Vijayakumar.



INSPIRE CAMP

Students from the “[INSPIRE Internship science camp](#)” visited the Department of Biomedical engineering. The event was co-ordinated by Dr. N. P. Rajesh, Assistant Professor, Department of Physics. The students visited the department, went through the Bioscience, Tissue engineering, Electronic devices, Diagnostic and Therapeutic equipment and Biomedical Instrumentation laboratories, and demonstrations were given to the students. Dr.R.Subashini, Asso.Prof/BME, coordinated the program on behalf of the department.





FACULTY VENTURES EXTERNALLY FUNDED PROJECTS: SANCTIONED:

- **Dr. S. Arunkarthick**, Asso.Prof/BME received the following external funded projects sanction by RECYCLE3D, Canada.

1. Prof.P. Ramasamy (PI), Dr. P. Balaji Bhargav, Dr. M. Senthil Pandian, Dr. R. Govindaraj, Dr. S. Arun Karthick (Co-PIs) “Design and development of disc-shape donors and inorganic acceptors for hybrid organic/inorganic solar cells”. Budget : 27.61 Lakh, Project Duration : 24 months

2. Dr. S. Arun karthick (PI) Dr. A. Murugesan, AP/Chemistry (Co-PI) , “Production and Commercialization of 3D-Printing Filaments from Recycled Plastic”, Budget: 6 Lakh, Project duration: 10 months.

SUBMITTED:

- **Dr. S. Pravinkumar**, Asso.Prof/BME submitted the following proposals:
1. “ Videostroboscopic and acoustic data modeling for voice health assessment and disorder identification using artificial intelligence” PI: Dr. S. Pravin Kumar, Associate Professor, Dept. of BME, SSN and Co-PIs: Prakash Boominathan, Professor & Head, Dept. of Speech-Language & Hearing Sciences, Faculty of Allied Health Sciences, Sri Ramachandra Institute of Higher Education and Research, Dr. A Ravikumar, Director ENT -HNS and Dean Education at Sri Ramachandra Institute of Higher Education and Research, submitted to Grand Challenges Exploration India by BIRAC.



2. “A WEARABLE FETO-MATERNAL MONITORING SYSTEM” PI: Dr.S.Dhanalakshmi, Associate Professor, Dept. of Electronics and Communication Engineering, SRM Institute of Science and Technology, Kattankulathur and Co_PIs: DR. S. Pravin Kumar, Associate Professor, Dept. of BME, SSN submitted to Grand Challenges Exploration India by BIRAC.

INTERNALLY FUNDED PROJECTS:

SANCTIONED:

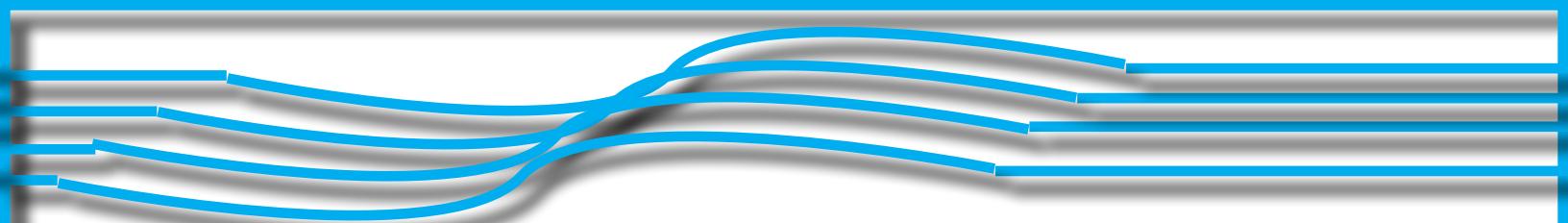
1. **Dr. J. Vijay**, Asso.Prof/BME “Design and Development of Wearable Textronic System for Monitoring Physiological Parameters” along with Co PI’s Dr. S. Saraswathi, AsP, CSE and Dr. S. Arun Karthick, AsP, BME. Budget: Rs.3.20 Lakhs. Project Duration: 30 Months.

2. **M. Dhanalakshmi** , Asst.Prof/BME “Design and development of Hi-Tech composite blades for lower limb amputees”. Budget: Rs. 1.90 Lakhs. Project duration: 12 months.

3. **Dr. S. Arun karthick**, Asso.Prof/BME “Functionalised nasal filter for ABS filtration”. Budget: Rs. 6 Lakhs. Project Duration: 36 months.

PRESENTED:

1. EMG analysis of Cricket batsman forearm muscles while executing different phases of batting strokes” PI:**Dr. Sachin**, AP/BME Budget : 4.5L



2. Automatic measurement of vocal fold vibratory parameters” PI: **Dr. S. Pravin Kumar**

3. Portable system to estimate Leukocytes. PI: **Dr.K. Nirmala**, AP/BME Co-PI: Dr. C. Vinothkumar.

JOURNAL PUBLICATIONS

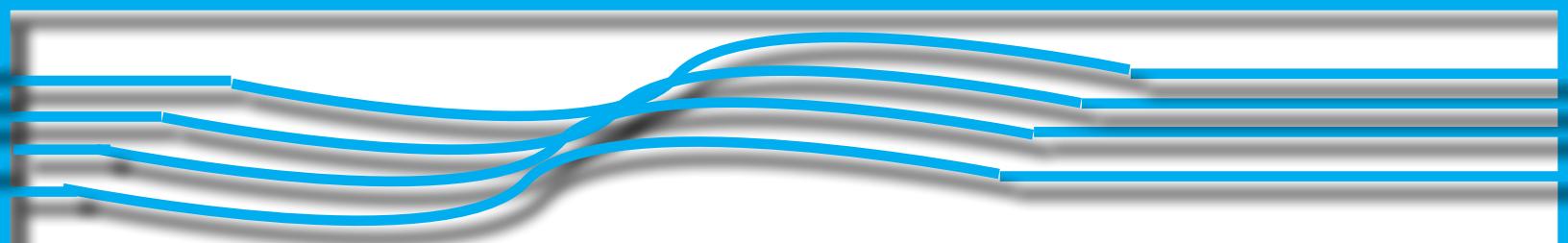
- **Geethanjali. B.**, Adalarasu, K., Jagannath, M., & Seshadri, N. G. (2019). Music-Induced Brain Functional Connectivity Using EEG Sensors: A Study on Indian Music. IEEE Sensors Journal, 19(4), 1499-1507. DOI: 10.1109/JSEN.2018.2873402; IF:2.61

CHAPTERS PUBLISHED

- Karthiga Nagaraj, **Vijay Jeyakumar**, A Study on Comparative Analysis of Automated and Semiautomated Segmentation Techniques on Knee Osteoarthritis X-Ray Radiographs, Lecture Notes in Computational Vision and Biomechanics, Springer, Vol. 30, pp 1655-1666. 30 Jan 2019.
- **Vijay Jeyakumar**, Bommannaraja Kanagaraj, “A Medical Image Retrieval System in PACS Environment for Clinical Decision Making” in In Intelligent Data-Centric Systems, Intelligent Data Analysis for Biomedical Applications, Academic Press (ScienceDirect), 2019, Pages 121-146, ISBN9780128155530.

EVENTS/MEETINGS ATTENDED

- **Dr. S. Pravinkumar**, Asso.Prof/BME visited Department of Speech & Hearing Sciences and interacted with Prof. Prakash Boominathan and his team at Sri Ramachandra Medical University. The purpose of this visit was to learn about the research facilities in the department and to explore the possible areas of collaboration.
- **Dr. S. Pravinkumar**, Asso.Prof/BME attended the first DC meeting for Mrs. Jeba Deva Krupa at SRM Institute of Science and Technology, Kattankulathur.
- **Dr. A. Kavitha**, Prof & Head/BME attended the Board of studies meeting held at AC Tech Campus, Anna University.
- **Ms. Divya.B**, AP/BME participated in the two day Workshop on “Brain computer Interface: Signals and Applications’ conducted at Centre for Medical Electronics, Anna University, Chennai.
- **Dr. J. Vijay**, AP/BME has participated in the workshop ‘Modeling & Deployment onto a SoC Using MATLAB & Simulink” organized by Teaching- Learning Centre, Coimbatore Institute of Technology, Coimbatore.
- **Dr. J. Vijay**, AP/BME and **Dr. A. Kavitha**, Prof & Head/BME had a online meeting with Dr. Toner Louis, Dean, Brimingham City University and Dr. Vivek Indramohan, Programme Director, M.Eng - Biomedical Engineering for possible SSN-BCU collaborative PG programme.



EVENTS ORGANISED

- An **industrial talk** was conducted by the department of Biomedical engineering to provide an excellent forum for the students to interact with industry personnel from different companies.

The expert members are

1. Mr. Sankar Ponnusamy, Head of Service Delivery ISC , Philips India Ltd
2. Mr. Anandan - Engineering Consultant, Former Senior Manager, Tamilnadu Medical Service Corporation, Chennai.
3. Mr. P.K. Kaviraj -Area Manager - Medi Analytika India Pvt. Ltd.
4. Mr. S. Kumar, Manager, Biomedical Applications,TMI Systems
5. Mr. Karthik Sekaran, Manager - Business Development, Carestream Dental India Pvt Ltd
6. Mr. Amit Kumar, Manager R&D, Mechanical, Phoenix Medical Systems Pvt Ltd.

The talk was a very productive interchange between the students and the experts which lasted for an hour. The talk began with a brief introduction of each personnel.

The following things were discussed,

1. The type of resume that is expected by an industry from an under-graduate student.
2. Qualification required to join a company
3. Different classes of jobs in the biomedical field like services, entrepreneurship, application-based services were enlightened.
4. The scope of biomedical research in India.



- **Ms.Divya.B, AP/BME and Dr.L.Suganthi, As.P/BME** organized a two day National level workshop on the topic “Brain Wave Robotics” with experts from Innovians Technologies in association with TECHNEX 19 (The Annual techno-Management festival of Indian Institute of technology Varanasi). The event was conducted at Career Development Centre.



Mr.Ashok demonstrating the use of NeuroSky brainwave sensor



Group photo with all the participants, trainers and the organising faculty

- A series of **technical talks** were organized under IEEE-EMBS:
 1. So you want a career in medical devices R&D?” by Mr. Jayaraman Kiruthi Vasan, Principal System Architect (Diagnostics), Healthcare Technology Innovation Centre, IITM, Chennai for Pre-final and final year UG BME on 20.02.2019 at BME seminar hall.
 2. Technical talk on Ventilators SV900C by Mr. K Venkatraman, Managing partner Technical, Biovision Medical systems for Students of BME- Pre-final years and PG on 23.02.2019 at DTE lab.

The talks were organized by **Dr. S. Pravin Kumar**, Asso.Prof/BME, Faculty Advisor, Mr. Arun Kumar, Chairman and Mr. Pavithran, Vice Chairman, IEEE-EMBS.

- A guest lecture was organized by **Dr. V. Mahesh**, Asso.Prof/BME.

Dr. N. Sujatha, Professor, Department of Applied Mechanics, IIT Chennai delivered a guest lecture for the students of Biomedical Engineering, on the title “Optical Holography - Principles, Wave fronts, interference patterns and application”.



Dr.N.Sujatha, Prof., IITM, lecturing the students on Optical Holography

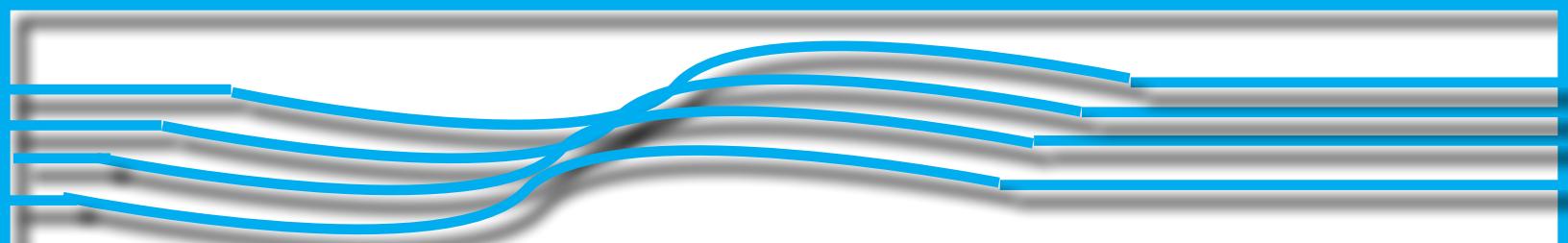


GUEST LECTURES DELIVERED

- **Dr. S. Bagyaraj**, Asso.Prof/BME delivered an Expert Lecture on Case Study: NIRS at a two day workshop on “Brain Computer Interfaces(BCI): Signals and Applications” at Centre for Medical Electronics, Department of ECE, CEG Campus, Anna University, Chennai-600 025.
- **Dr. B. Geethanjali**, Asso.Prof/BME gave a special lecture on “Innovative Technologies at Healthcare” at Periyar Maniammai Institute of science and Technology, Thanjavur for their “Two Days International Conference on Innovative Technologies in Electronics and Healthcare”.

OTHER ACTIVITIES

- **Dr. S. Bagyaraj**, Asso.Prof/BME was invited as Chief Guest for 16th National Level Technical Symposium- PEPIEC-19 held at Department of ECE, Annai Teresa College of Engineering, Villupuram.
- **Dr. S. Arunkarthick**, Asso.Prof/BME chaired an Oral Technical Session in the 4th International Conference on Recent Advancements in Chemical, Environmental and Energy Engineering (RACEEE-2019), held at SSNCE.



STUDENT ACTIVITIES

PROJECT PROPOSAL:

The students of the final year had submitted a project proposal titled “Development of smartphone-enabled Dermatoscope for automated skin Lesion” to Tamilnadu State Council for Science and Technology. The Council has accepted their submission and sanctioned funding of Rs.7500. Dr. J. Vijay As.P/BME is guiding the project.

PATENT PRELIMINARY PRESENTATION:

The following projects were presented in the Preliminary patent committee meeting held on the 25th February,2019 at Admin conference hall:

1. Composite blades for lower extremity amputees . Viswanath S, Praveen G, Om Prakash S and Mrs. Dhanalakshmi AP/BME(Project guide)
2. A knee brace for Genu Recurvatum. Viswanath S, Kesiya M, and Mrs. Dhanalakshmi AP/BME (Project guide)
3. Non Invasive EGG Procurement belt for gastric oddities detection. Praveen kumar G. Om Prakash S, Asha R, Sangeetha B , B. Divya AP/BME, Dr. L Suganthi As.P/BME(Project guide)



PAPERS PRESENTED

The following papers were presented in an International Conference:

1. Anuharshini K, Sowmya M, Sivaranjani M, Geethanjali B. and Mahesh Veezhinathan, “Analyzing the music perception based on physiological signals”, IEEE 2019 International Conference on Advanced Computing ; Communication Systems (ICACCS), 15th - 16th March 2019.
2. Pavithran P G, Arunkumar K, N P Guhan Seshadri, Bikesh Kumar Singh, V. Mahesh and B Geethanjali, “Index of Theta/Alpha ratio to quantify visual -spatial attention in dyslexics using Electroencephalogram”, IEEE 2019 International Conference on Advanced Computing & Communication Systems (ICACCS), 15th - 16th March 2019.
3. Kirthana M, Abarna R, Anjana K R, Geethanjali B and Mahesh Veezhinathan, “A study on pulmonary function influenced by occupational exposure using spirometric parameters”, 2019 IEEE International Conference on Innovations in Communication, Computing and Instrumentation. Chennai.
4. S.Viswanath and S.Apurva,“Standardization of Sodium Acetate Trihydrate for Potential heat therapy”, 4th International Conference on Recent Advancements in Chemical, Environmental and Energy Engineering (RACEEE) organised by Chemical Department, SSNCE,14th February,2019.

ARTICLES

CRISPR:

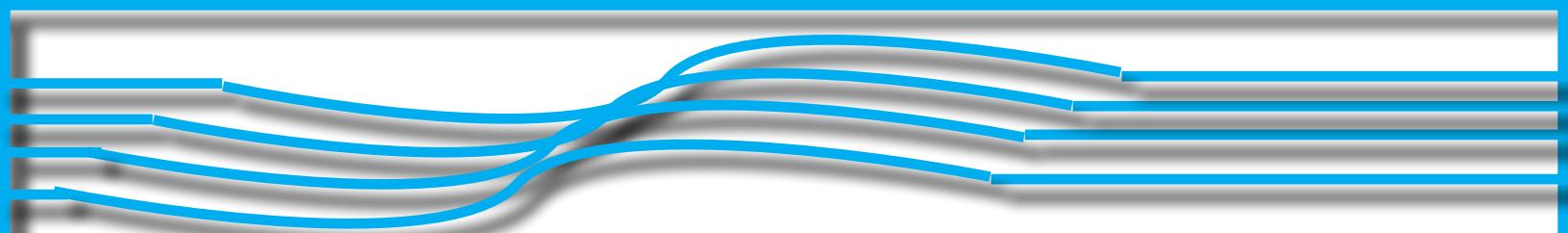
Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) has been branded the new genetic revolution of the century. What is it about this new gene editing technology that's getting everyone in the scientific world so excited? The simple answer: because it has the potential to change humanity forever. CRISPR technology could be the key to eradicating harmful viruses, correcting genetic diseases and extending our lifespan. Yet, like any discovery involving genetic modification, it brings with it all manners of dangers and controversies.

What is CRISPR?



For decades scientists have been discovering ways to tinker with the DNA of food, plants, animals and even humans, with impressive results. CRISPR is a sort of DNA surgeon that can edit, target and study live cells, making it the most advanced gene editing technology yet.

CRISPR is another name for the natural mechanism found in the immune system of bacterium cells that fight off invading viruses. When the virus attacks again, the cell produces a protective enzyme known as Cas9 which simply cuts out the infected DNA strands. This ability to 'cut' DNA strands is what makes this technology different from other types of gene editing.

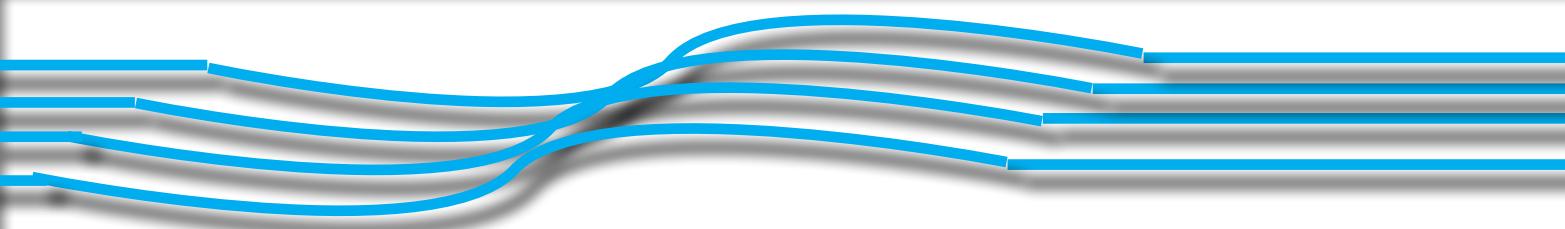


What does CRISPR do?

As DNA has a profound effect on our health, having the power to programme it to delete, modify or add information to living cells could completely transform the way we treat disease. For example, it could cure debilitating genetic diseases. Over 3,000 genetic diseases are caused by incorrect letters (known as nucleotides) in a patient's DNA, so by simply cutting out the faulty letter and replacing it with a copy of the correct one could extend a lifeline for sufferers of genetic diseases like sickle cell disease, cystic fibrosis, Huntington's disease and haemophilia.

Previously, editing DNA was extremely expensive, complicated and time consuming, so another huge benefit of CRISPR is that it is a much faster and cheaper way of engineering genes. Better yet, the technology can target specific DNA sequences thanks to being easily matched with 'guide' RNA sequences that lead them straight to the DNA target. This could revolutionise the treatment of retroviruses like HIV following decades of painstaking research. In 2015, scientists cut the HIV virus out of living cells from patients in the lab and found that they were able to remove 50% of the virus. It is thought that the technology can create personalised versions of HIV-resistant DNA to clear the disease permanently from their system. This is still in the very early stages of development, but scientists predict that a cure for HIV is in our grasp.

Similarly, CRISPR has the potential to act as a ground-breaking tool for the diagnosis and treatment of cancer, one of the biggest threats to human health to-

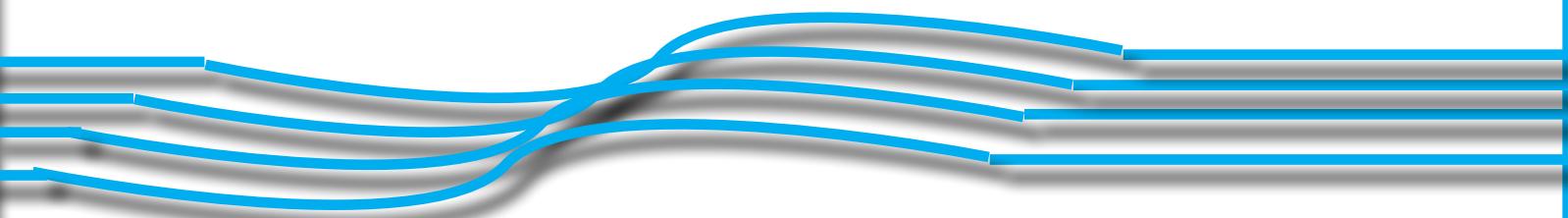


day. The new technology could act as a ‘cancer killer’ by modifying immune cells to better recognise and destroy deadly tumours. Imagine a future when cancer can be cured simply by a series of injections that contain thousands of a person’s own specially engineered cells! Considerably more appealing (and effective) than gruelling chemotherapy and radiotherapy treatments. The first clinical trial of a CRISPR cancer therapy for humans has already been approved in the USA and a European trial will likely happen shortly after.

One of the most exciting things about CRISPR technology is that it works on every type of cell: human, animal, plant, microorganism etc. This versatility could solve several of humankind’s biggest problems. CRISPR could provide a way to create abundant supplies of transplant organs, saving thousands of lives worldwide. It could help fight world hunger by modifying crops to withstand climate change and engineer vitamin-rich fruits and vegetables to sustain malnourished populations. Endangered and even extinct species may be revived using CRISPR, or saved by ‘genetic rescue’ from types of species that threaten health, such as mosquitos. This could be achieved by preventing viruses from entering the salivary glands of mosquitoes.

Is there a downside to CRISPR?

As CRISPR is still a first-generation tool, its full potential (as well as its limitations) are still to be fully realised. For instance, scientists cannot know the long-term implications of editing genes in this way and the impact it may have on hu-

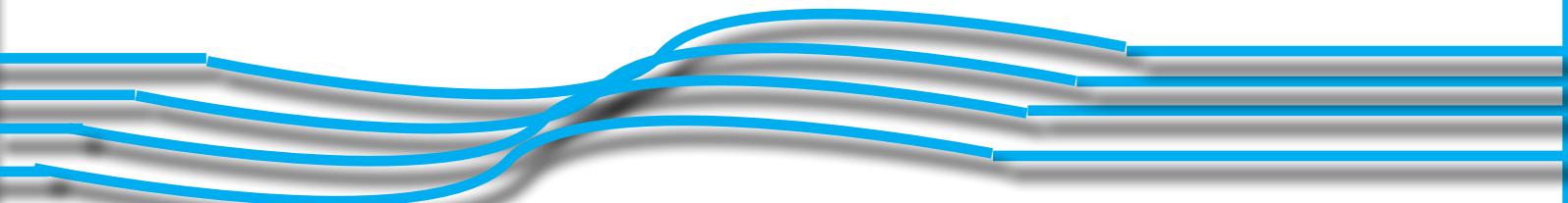


mans. They must also accept that any changes made in an individual will not be passed on to future generations, unless CRISPR is used on reproductive cells and embryos which is the source of a lot of controversy.

The controversy over modifying humans in this way is rooted in both science and moral conscience. Do we know enough about the genome to fully understand the implications of changing DNA sequences in an embryo? Editing embryos over several generations could lead to irrevocable changes to the human gene pool that are difficult to predict. There are also several arguments insisting that interfering with embryos is morally questionable and allows scientists to ‘play God’. Equally, using CRISPR to revive extinct species may be an exciting prospect, yet having the power to eradicate entire species that are harmful to humans (such as mosquitos) could be seen as morally abhorrent and may have unforeseen effects on the planet’s wider ecosystem.

It’s difficult to know at this early stage where genetically modifying human genes will take us. We may come to believe that not using CRISPR technology to edit faulty genes and prevent the suffering or death of children is unethical.

There is no doubt that CRISPR technology is one of the most revolutionary breakthroughs of modern medicine, with the potential to tackle not only medical challenges but those of humanity as a whole. However, a powerful technology must be handled with caution and there is still much for scientists to discover about its capabilities.



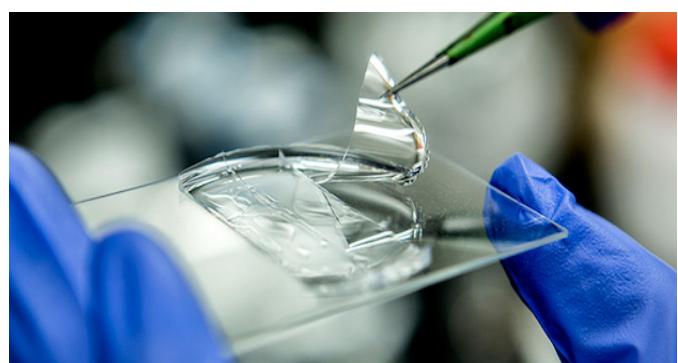
MEDICAL PLASTICS

New elastomers achieve unprecedented 5000% elongation at break

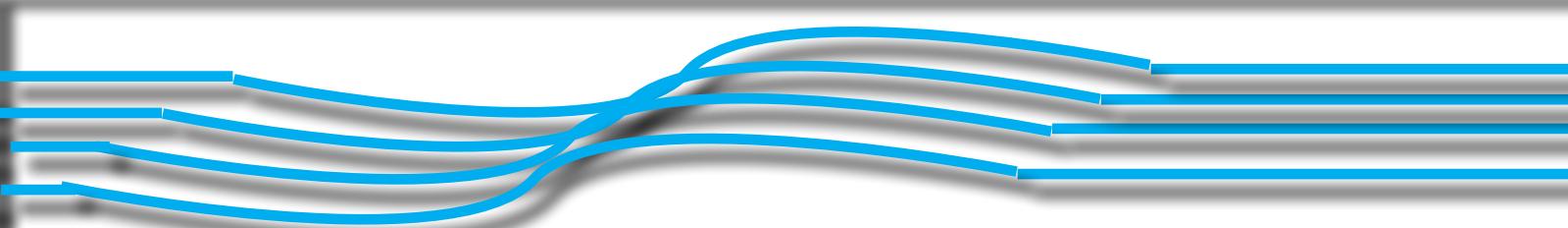
Materials technology company Gelest Inc. (Morrisville, PA) introduced in January a new class of elastomers that achieves unprecedented elongation and shape-recovery properties. The silica nanoparticle-reinforced material approaches 5000% elongation at break; for example, a two-yard piece of the elastomer can stretch the length of a football field and return to its original shape.

The ExSil 100 elastomer can be used as the base polymer in microfluidic devices, used for in vitro diagnostics, that can be stretched and rolled without failure, according to the company. Its properties also hold potential for wearable medical devices that can be stretched to suit various anatomies and next-generation prosthetics.

Implantable medical electronics that disappear when their job is done



Wireless brain sensors that incorporate bioresorbable electronics and materials have been developed by a team of neurosurgeons and engineers to temporarily monitor intracranial pressure and temperature.



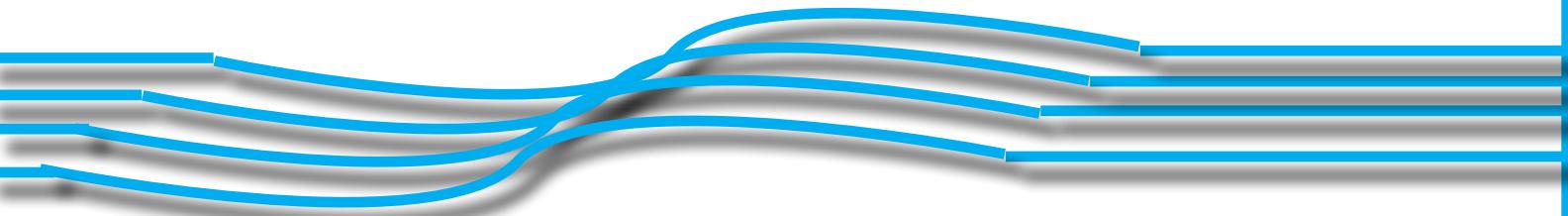
Scientists at Washington University School of Medicine in St. Louis and engineers at the University of Illinois at Urbana-Champaign produced a clinically usable pressure sensor consisting of a polylactic-co-glycolic acid membrane suspended in a frame of silicon and magnesium. The pressure of the surrounding fluid causes the membrane to bend, which changes the electrical resistance of an adjoining silicon sensor. The whole device is then wrapped in a watertight polymer that gradually erodes over a few days, setting the lifetime of the sensor.

New stretchable polymer extends design possibilities of wearable electronics

Panasonic (Osaka, Japan) has developed a soft and flexible resin that can repeatedly stretch more than 2.5 times its relaxed length and return to its original form without damage. Combined with a transparent electrode material and material paste, also developed by the company, the insulating material made of a thermoset resin augmented by Panasonic's proprietary resin design technology is well suited for wearable devices, among other applications. [Read more](#)

Thin polymer film could revolutionize monitoring of cancer patients

A thin, stretchable polymer-based film that can coil light waves like a Slinky could make monitoring of cancer survivors more effective and less expensive. Developed by University of Michigan chemical engineering researchers, the film provides a simpler, more cost-effective way to produce circularly polarized light, part of a process that could eventually provide an early warning of cancer recurrence.



Researchers took a rectangle of PDMS, the flexible plastic used for soft contact lenses, twisting one end 360 degrees and clamping both ends down. They then applied five layers of reflective gold nanoparticles—enough particles to induce reflectivity, but not enough to block light from passing through. Alternating layers of clear polyurethane were used to stick the particles to the plastic. Finally, the researchers untwisted the plastic. The plastic can be stretched and released tens of thousands of times, altering the degree of polarization when it's stretched and returning to normal when it's released.

New hybrid polymers could herald third chapter in polymers history

A new class of material—hybrid polymers, which incorporate rigid and soft nano-scale compartments, the latter of which can be removed and regenerated—has been developed by researchers at Northwestern University (Evanston, IL). Capable of contracting and expanding like muscles and rapidly responding to environmental stimuli, the polymers could be used one day to develop implantable materials that function in a life-like way and for use in drug-delivery and energy-source applications.

FROM THESE.....



TO THIS !!!!



g.Nautilus is g.tec's new wireless biosignal acquisition system. Its design is completely different from all other devices and it sets a new standard of usability. The tiny and lightweight device is attached to the EEG cap to avoid cable movements and to allow completely free movements. In combination with g.tec's active electrode technology, you will get top quality EEG recordings from 64/32/16/8 channels within few minutes.

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