

SEPTEMBER 2019

BIOTECH MAGAZINE

Inspiring Young Minds

By **SRISHTI – BT FORUM**

Vision:

To be a best institution imparting quality engineering education to deal with community needs through learning and

Mission:

- To implement path breaking student centric education methods.
- To augment talent, nurture teamwork to transform to develop individual as responsible citizen.
- To educate the students and faculties about entrepreneurship to meet vibrant requirements of the society.
- Strengthen Industry-Institute Interaction for knowledge sharing.

Sri G. Dayanand [Chairman]

The “ANVESHANA – inspiring young minds” newsletter of the department of BIOTECHNOLOGY is providing great space for the students and faculty to pen down their innovative ideas, imagination and perceptions to show case creativity. So, I take the opportunity to congratulate the Department of BIOTECHNOLOGY and its editorial team to successful release of this issue. I am sure that students and faculty will find the content of this edition very interesting and educating.



Sri G.D. Manoj [Executive Director]

I am indeed happy to share that department of BIOTECHNOLOGY is having its monthly newsletter “ANVESHANA – inspiring young minds” from 2012. I personally urge all faculty members and students of the department to make use of the platform to share and educate among themselves in publishing article pertaining to the emerging domain and interesting facts. I congratulate the team of Biotechnology editorial committee.



Dr. H Ramakrishna [Principal]

It gives me immense pleasure to note that, SCE has been publishing bi-annual newsletter and I am sure, this will provide an opportunity for the faculty and students to share their knowledge and beacon the information about various issues and activities that are being taking place in the department. I look forward for more activities and achievements for the department to march towards excellence in the future. I would like to thank all teaching, supporting staff and our beloved students for their active participation in publishing this magazine. My special compliments and congratulation to the editorial team of the department for their consistent effort in publishing this newsletter.



Dr M H Annaiah [Vice-Principal]

I am very happy and delighted to know that our college is bringing out the college newsletter. SCE is one of the leading premier engineering colleges in the country offering quality technical education to students thereby enabling them to become globally acceptable engineers in their domains. The newsletter provides a platform for both faculty and students to showcase their achievements and hidden talents. I congratulate our beloved principal and members of editorial board for bringing out this excellent and informative newsletter on time.



Dr Veena S More [HOD]

It is immensely gratifying to note that our students and faculty members have created a platform to express their scientific and artistic talents through the newsletter "ANVESHANA – inspiring young minds". This type of newsletters are very much necessary for an educational institution to keep pace with the latest trends and to promote creative thinking and innovative abilities of students. The combination of experienced staff and enthusiastic students will take this newsletter to the new heights. On this occasion, I would like to place a special word of appreciation for my dear students and the staff whose untiring efforts have made it possible to bring out this informative newsletter and wish them good luck.



TECHNICAL TALKS AND SEMINAR

"SCOPE AND FUTURE OF GENOMICS DATA SCIENCE IN REVOLUTIONING MEDICINE"

This seminar talk was given by the COO - Gaurab Banerjee of MOLSYS SCIENTIFIC on 3.9.19 for the 3rd, 5th and 7th semester students.

The students were given an introduction to the genomics. There was a briefing on the implementation of data science in the field of genomics. The students were given a clue on the implementation of next generation sequencing in diagnostics. They were also informed about the industrial scenario of genomics data science.

Students were also guided about the skills they require to learn to get into the genomics and data science such as PYTHON programming language and R programming languages and other biostatistics tools. They were presented with a case study about development of superbug that are antibiotic resistance and how genomics could prove to be an efficient tool against them by giving quick analysis and interpretation.

Students were also introduced to cloud computing and how it could be implemented in storage of large data generated by research in the field of life-science and an idea on the works carried out by the Molsys company.

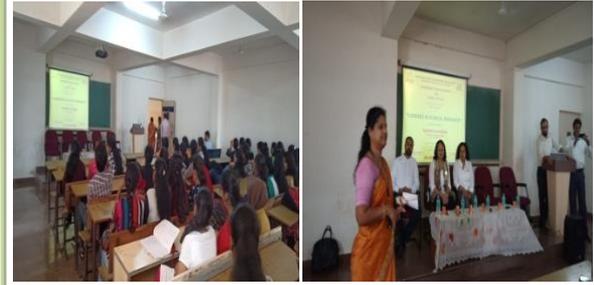


“CAREERS IN CLINICAL RESEARCH”

A one day symposium was conducted on 23 September,2019 which was organised by the Srishti forum for students of all the semesters of BT department .

The chief guest of the seminar was Mrs Nandini Vijaisimha , Head, HR and Administration (INDIA) ,MMS HOLDINGS INC.

The seminar was aimed at giving a brief idea to the students about what is medical writing, the scope and trends of medical writing in the industry ,working of a contract research organisation, steps in clinical trial and implications of medical writing in clinical trials



INDUSTRIAL VISITS

BIO CENTRE [Hulimavu,Bengaluru]

On 25th September 2019, a one day industrial visit to Biocentre, Hulimavu was organised for the 7th semester students by the BT department.

The students got live experience on the work` carried out by the horticulture department. The students got to learn about various techniques and instrumentations applied in soil, water and plant analysis .We were able to relate the theories from text book with the real life implications of techniques used in plant tissue culture and methodologies used for preparation of bio-fertilizers .

We also had an induction about mushroom culturing carried out in a commercial scenario. We also got to learn about the little known but medically significant plants. Overall the whole visit was an amazing learning experience.



FORENSIC SCIENCE DEPARTMENT [Sapthagiri Medical College]

The students of 7th semester visited the Forensic department at Sapthagiri Medical College on the 19th of September, 2019 as a part of their Subject Curriculum.

This visit enabled us to understand the exact procedures followed by the Forensic department in aiding the investigating and Judiciary system with an unbiased Scientific report with respect to Crimes, Accidents and Natural causes of death.

Extensive details on domains such as forensic anthropology and an extensive collection of preserved specimens of organs, foetus, toxic flora and fauna, and body parts of the victim evidential of the crime made us understand the significance of the subject that we are currently learning.



JUBILANT DISCOVERY CENTRE [Yeshwanthpur, Bengaluru]

A visit was arranged to Jubilant Biosys Ltd. a part of Jubilant Life Sciences on the 20th of September 2019.

The visit to Jubilant Biosys provided an insight on how Contract Research Organisations operate and provide services.

A talk was given on the extensive process and the stringent regulations that a comprehensive drug delivery service provider such as Jubilant goes through to successfully develop a drug and commercialise it.

A visit to the Biological, Informatics and Chemical Laboratory sections of the organisation imparted an understanding in a practical manner. Through this we also understood the importance of Discovery Informatics, Computational Chemistry, Medicinal Chemistry, Structural Biology, In-Vivo and In-Vitro models and Translational Sciences related to their work flow.



ORAL AND POSTER PRESENTATIONS

The students participated in Oral and Poster Presentations at the following National Conferences:

- **TEQUIP Sponsored National Conference on “Recent trends in Biochemical Engineering and Biotechnology (RTBEB-2019)”** from 19th to 20th September 2019 at KLE
- **AICTE Sponsored National Conference on “Emerging Multi Disciplinary trends in Biotechnology and Engineering: A future perspective”** from 23rd to 24th August 2019.
- **National Symposium on “Environmental Pollution Prevention and Control : Future Perspective”** 2019 at NITK, Surathkal from 23rd to 25th August 2019.



FACULTY



Mr. Anand HV [Assistant Professor] from the Department of Biotechnology gave a Guest lecture at the “**Scientific Innovation Seminar**” at IISc, Bengaluru on the 30th of August, 2019.

PLACEMENTS



We take immense pleasure in announcing that our students of 7th semester,

- ❖ **Hema JN,**
- ❖ **Mahima M Siddeshwar and**
- ❖ **Reachikaa Rajeswari.S**

have been placed at Extra marks an E-learning platform during the campus recruitment held at Sapthagiri College of Engineering.

ARTICLES

A NEW TOOL FOR PLANT GENOME EDITING

Altering the genetic code of crops and other plants to improve survival and yield, or to study physiology, has long been the pursuit of plant scientists and breeders. One of the newest methods for such genetic tinkering is called base editing, which utilizes modified components of the canonical CRISPR-Cas9 gene-editing system to make point mutations at specific nucleotides within the genome. The technique was originally developed by David Liu of Harvard University and colleagues for use in mammalian cells, but other scientists have recently adapted it for plants.

When using the traditional CRISPR-Cas9 system, researchers could choose between introducing mutations efficiently (by cutting the target gene, which creates random insertions or deletions during repair) or precisely (by introducing a DNA repair template containing a desired sequence change). The latter requires homology-directed repair, which tends to occur infrequently. Because base editing requires neither cutting nor templates, it can be both efficient and precise.

Scientists have been using cytosine base editors (CBEs), which convert C-G base pairs to T-A base pairs, in plants since 2017. Now, four groups of researchers, including Jin-Soo Kim and colleagues from the Institute of Basic Science in Daejeong, South Korea, have adapted adenine base editors (ABEs), which convert A-T to G-C, for use in plants too.

To make ABEs plant-friendly, “we optimized the codons [in the ABE expression vector] . . . and tested several plant promoters,” writes Kim in an email to The Scientist. The other groups employed similar optimization strategies.

Using their plant-tailored ABEs, Kim’s team altered one amino acid in the model plant *Arabidopsis thaliana* to convert it to a late-flowering variety, and altered a single splice site to create albino plants (*Nat Plants*, 4:427–31, 2018). “It was a proof-of-principle study,” Kim writes, and having shown that it works, “we are very excited.” Other researchers have used ABEs to produce herbicide-tolerant rice (*Genome Biol*, 19:59, 2018).

Plant scientist Alan Bennett of the University of California, Davis, who was not involved with any of these projects, is enthusiastic about the potential for base editing in plants. “It expands the toolkit for genome editing in plants, which is fantastic,” he says. “You now have more options, more opportunities to make

BODY CLOCK INFLUENCES HOW WELL THE IMMUNE SYSTEM WORKS

New research in mice has found that the immune system does not respond equally well at different times of the day. This suggests that the body clock may influence mechanisms related to immunity.

Circadian rhythms, which people commonly refer to as “body clocks,” are the body’s automatic means of adjusting biological mechanisms, such as hunger and the need for sleep, according to natural rhythms, such as the day-night cycle. Body clocks also regulate other “self-drive” mechanisms, including breathing, heartbeat, and body temperature.

Researchers already know that circadian rhythms influence many different aspects of our internal mechanisms. However, they do not yet know the full extent to which these “clocks” help determine our well-being. Circadian rhythms are common to all mammals. So, a team of investigators from the Douglas Mental Health University Institute and the Université de Montréal in Canada studied mice to find out whether body clocks can affect how well the immune response works.

Through their study, the scientists found that the CD8 T immune cells that the body uses to fight off infections and cancer tumors work with various degrees of efficiency at different times of the day. Time of day affects T cell response

The researchers worked with two groups of mice. They genetically engineered the first group by switching off specific genes that regulate circadian rhythms and left the genes naturally active in the second group. The team administered a vaccine to rodents from both these groups to trigger an immune response. “Using a mouse vaccine model, we observed that after vaccination, the strength of the CD8 T cell response varied according to the time of day,” says one of the study authors, Prof. Nicolas Cermakian.

“Conversely, in mice whose CD8 T cells were deficient for the clock gene, this circadian rhythm was abolished, and response to the vaccine was diminished in the daytime,” Prof. Cermakian continues. Earlier studies had already hinted that the time of day might influence the proliferation of immune cells, including T cells. However, it had remained unclear whether this came as a result of circadian rhythm interference or not. By working with both genetically



We are happy to share that, our students and faculty members are regularly contributing articles (technical and nontechnical), photos, puzzles, cross words for the department newsletter - “Anveshana” which enriches the student community with awareness and knowledge on recent trends in biotechnology. also, its a platform to exhibit their extracurricular and co-curricular skill .On behalf of Anveshana’s editorial team, I thank all the writers, student editors, other contributors for helping us in bringing this issue colorfully.

Prof. Prashanth Kumar H P
(Editor, Biotech magazine)