



#### Declared as Deemed to be University under Section 3 of UGC Act 1956

#### DEPARTMENT OF LIFE SCIENCES INITIATIVE

#### **VOLUME 1, ISSUE 5, 2016**

#### **EDITORIAL COMMITTEE**

STAFF EDITORS: Dr Praveen N Prof Vasantha V L

STUDENT EDITORS: Darshika Bohra Amrita Nair

#### **INSIDE THE ISSUE**

The suicide plant	1
Nipping Ebola in the bud	2
How not to lose your mind	4
Zombie Bacteria	7
Dogs to detect cancer	9
New virus in town-Zika virus	9

I understand that the department of Life Sciences is coming out with the annual newsletter, BioLink, for the fifth consecutive year. The Department has shown consistent advancement by conducting innovative informative seminars, guest lectures, and certificate courses, e-learning and related activities for the students to enhance their learning beyond the curriculum. Mandatory internal and external projects help the students to get an insight into the research activities going on in industries and other advanced laboratories. I hope this newsletter serves as a platform to budding biologists to make fruitful contribution in the coming years and create a new era with their novel work. The newsletter with latest information on science and technology helps the students to increase their horizon. I congratulate the editorial team for their efforts in bringing out BioLink.

Dean's Message

#### From the Editors' Desk

The Department of Life Sciences has been successfully publishing BioLink for the past four years. This venture started in 2012 with the aim of showcasing the recent trends in the upcoming field of biotechnology, depicting the talents of our students and colleagues and to highlight the activities of the department in a precise and easily readable form. The great response from the readers in the past has inspired us to continue this venture. We believe that the students have done a great job in bringing out the newsletter. They have worked relentlessly to execute this challenging task and finally came up with this informative issue. We present BioLink 2016 with a hope that our readers will enjoy reading it as much as enjoyed compiling it.

> Dr Praveen N, Prof Vasantha V L (staff editor), Darshika Bohra and Amrita Nair (student editors)

# **The Suicide Plant**

Gympie Gympie, the suicide plant, or moonlighter, is a large shrub native to rainforest areas in the northern half of eastern Australia, and Indonesia

*Dendrocnide moroides,* having monocious inflorescences in which the few male flowers are surrounded by female flowers. The flowers are small, and once pollinated, the stalk swells to form the fruit. Fruits are juicy, mulberry-like, and are bright pink to purple. Each fruit contains a single seed on the outside of the fruit.

It is best known for stinging hairs that cover the whole plant and deliver a potent neurotoxin when touched. It is the most toxic of the Australian species of stinging tree. Contact with the leaves or twigs causes the hollow, silica-tipped hairs to penetrate the skin. The sting causes an extremely painful stinging sensation that can last for days, weeks, or months, and the injured area becomes covered with small, red spots joining together to form a red, swollen mass. The sting is potent enough to kill humans, dogs, and horses, and is infamously agonizing.

"Being stung is the worst kind of pain you can imagine - like being burnt with hot acid and electrocuted at the same time," Stories tell of one Australian officer shot himself to escape the pain of a sting. Hence called the suicide plant.

Nidhi Girish- 2 BCZ

# **Thou Shalt Mimic**

Batesian mimicry is a form of mimicry where a harmless species has evolved to imitate the warning signals of a harmful species directed at a predator of them both.

Indian Wolf snake (*Lycodon aulicus*) which is nonvenomous is most often mistaken to be a Common Krait (*Bungarus caeruleus*) by many as an instance of Batesian mimicry. Common Krait is one of the most venomous species found in India. They are among the big four, that is the species which causes the maximum number of deaths in India which includes Spectacled Cobra (*Naja naja*), Russell's Viper (*Daboia russelli*) and Saw Scaled Viper (*Echis carinatus*).

Arjun S Menon- 2BCZ

# How many chromosomes does a mule have? (A horse has 64, a donkey has 62)

63. A mule is the offspring of a male donkey and a female horse. Mules have 63 chromosomes, a mixture of the horse's 64 and the donkey's 62.



#### Nipping Ebola virus in the bud

Ebola, an epidemic that has claimed the lives of several innocent people in regions of West Africa. The latest study by a group of researchers in University of Pennsylvania on the link between host calcium signaling pathways and viral budding has shown the world of medicine some promise.

According to the paper that was published in October 2015, a possible link has been established between the amount of cytosolic calcium present in the host cell and rate of virus budding. Cell channel proteins like Orai and STIM1 especially have found to be of significance in their reproductive mechanism. Orai family proteins are associated with G protein coupled receptors in human cells which on activation, leads to successive triggering of molecules like Phospholipase C and then Inositol triphosphate (IP3). IP3 acts on the receptor channels in the endoplasmic reticulum and causes release of  $Ca^{2+}$  ions from them. During this process, STIM1 proteins in the plasma membrane undergo conformational changes allowing CRAC channels (Calcium Release Activated Calcium) to function and regulate the entry of extracellular calcium into the cell.

While the general functions of the Orai and STIM1 are already known by the scientific world, the fact that this  $Ca^{2+}$  entry pathway becomes all the more functional in the presence of viral particles seemed to prove the importance of this ion in understanding their reproductive mechanism. Through the course of the study, the matrix proteins of EBOV, MARV and JUNV were found to initiate Orai dependant  $Ca^{2+}$  signal in the host and the suppression of Orai and STIM1 adversely affected the pace of disease progression.

Inhibiting calcium availability in the cell is not bound to permanently stop the virus from spreading within the host but scientists have hopes that it will be able to handicap it long enough for the patient's immune system to develop a suitable anti-viral response. Having a foothold on the rate at which Filoviruses and Arena viruses assemble and bud during their lifecycle is a promising way of ensuring that the diseases can be detected and cured at an early stage.

Dalia S- 2 BCZ

Which infectious agent is the<br/>most resistant to<br/>sterilization?

Prion. The smaller the agent, the more difficult it is to destroy it. Prions are quite resistant to proteases, heat, radiation. and formalin 134°C  $(274^{\circ}F)$ treatments. for 18 minutes in а pressurized steam autoclave may not enough be to deactivate the agent of disease. Prions may last for decades in the environment

# Things the Nation wants to know-

# Aspirin targets key protein in neurodegenerative diseases.

A breakdown product of aspirin blocks cell death associated with Alzheimer's, Parkinson's and Huntington's disease.

Date: November 30 2015

**Source**: Boyce Thompson Institute for Plant Research.

**Summary:** The active ingredient in aspirin blocks an enzyme glyceraldehyde-3-phosphate dehydrogenase that triggers cell death in several neurodegenerative diseases. More potent forms of salicylic aspirin exist, which may provide treatments for these diseases.

# Marijuana dependence influenced by genes, childhood sexual abuse:

#### Date: November 23 2015

Source: Washington University in St. Louis

**Summary**: Genetic variation within the endocannabinoid system may explain why some survivors of childhood adversity go on to become dependent on marijuana, while others are able to use marijuana without problems, suggest new research.

### Insect DNA extracted, sequenced from black widow spider web. Insect Dna remained detectable on spider web for atleast 88 days.

Date: 25 November 2015

Source: PLOS

**Summary**: Scientists extracted DNA from spider webs to identify the web's spider architect and the prey that crossed it, according to this proof-of concept-study.

#### Exploring the causes of cancer. Understanding the regulation of a cell surface protein involved in cancer.

Date: Nov 23, 2015

Source: Queen's University

**Summary**: Cells communicate with other cells in our body by sending and receiving signals. Cancer can occur when these signals are 'dysregulated' and abnormal cells grow out of control, scientists have determined.

Aditi Gurung- 2BCZ

# Which plant is hazardous to harvest when it is wet?

Tobacco. Green Tobacco Sickness is a type of nicotine poisoning caused by the dermal absorption of nicotine from the surface of wet tobacco plants. The symptoms include vomiting, headache and fluctuations in blood pressure and heart rate.

# Can You Answer Them-

**Q 1**: A bloke walks into a pub, and asks for a pint of Adenosine Triphosphate. What does the barman says? **A**: That'll be 80p (ATP) please!

**Q2**: How do you eat DNA-spaghetti? **A:** With a replication fork.

Q3: Which biochemicals wash up on beaches? A: Nucleo-tides.

**Q4:** What did the male stamen say to the female pistil? **A:** I like your "style"

**Q5:** Where do they send the criminal neurons? **A:** To the chain ganglion.

**Q6:** Why is the mushroom always asked to a party? **A:** Because he's a fungi (fun guy)

**Q7:** What is the fastest way to determine the sex of a chromosome? **A:** Pull down its genes.

**Q8**: Where do hippos go to university? **A:** Hippocampus

**Q9:** What did one cell say to his sister cell when she stepped in his toe? **A:** Mi-to-sis

**Q10:** Did you hear about the famous microbiologist who traveled to thirty different countries and learned to speak six languages?

A: He was a man of many cultures.

Anushree- 2BCZ

### How not to lose your mind-

**1**. Fall in love with your brain.

2. Get a baseline assessment of your brain's health and function.

3. Optimize your important health numbers, not just normalize them. Use smart combinations, in a multiple mechanism approach. they are much more effective. For example, Omega 3 fatty acids to decrease inflammation and improve mood. Ginkgo to boost blood flow and memory Probiotics to support gut health. Alpha lipoic acid to help stabilize blood sugar levels and protect against nerve cell damage and B vitamins and phosphatidylserine for nutrient loading and energy.

Anuja Joseph-2BCZ

# Can You believe It?

#### Hydroelectric baths for migraine-

Taking the toaster into the bathtub may be fatal today, but for several decades starting in the late 19th century, some doctors recommended treating chronic migraines by lounging in a hydroelectric bath – a warm tub with a small current passing through the water. Doctors eventually became skeptical of this method, and today's migraine sufferers have effective pharmaceutical treatments.

#### Gasoline to cure lice-

In the early 20th century, a patient with a bad case of head lice would douse his or her dome with gasoline or kerosene in an effort to rid their scalp of the unwanted guests. It was incredibly dangerous to anyone who walked near an open flame. Modern medicine can solve the infestation much more safely with medicated shampoo.

Priya-2BCZ

# A new drug for Melanoma.

Scientists have developed a drug that shows promise for treating deadly forms of skin cancer, such as melanoma, which are resistant to a lot of existing therapies. The new compound, SBI-756, targets a specific molecular machine known as the translation initiation complex. These structures are in every cell and play the critical role of translating messenger RNA into proteins. In cancer cells, the complex is impaired, producing extra protein and providing a growth advantage to tumours. SBI-756 causes the translation complex to dissociate and inhibit melanoma cell growth. About 50% of melanomas are caused by mutations in a specific gene called BARF. Patients with these tumours are commonly prescribed vemurafenib, a BARF inhibitor that shrinks tumours. The team found that if SBI-756 is co-administered with vemurafenib, the tumours disappeared and did not reoccur. Even in mice with advanced or late-stage BARF-driven cancer, the reappearance of resistant tumours was slowed down by including SBI-756.

Chris Maria, Patricia-2BCZ

# Did you know that gene editing costs only about thirty dollars?

We often comment on each other's features with statements like "your eyes are beautiful: or "you have short legs". These comments have the power to make us feel good or bad about ourselves. Nevertheless, we cannot help the way we are. With gene therapy we can alter our features as we like.

Gene therapy is not a new technology. It has been

mentioned since the 1990s. what we have heard

about gene therapy was that it was inefficient, ineffective and was unimaginably expensive. However, a new gene therapy technique has emerged called CRISPR that has overcome all these problems, making gene therapy a reality.

CHRISPR, is an enthralling bacteria based gene therapy technique. In this technique a probe is dispatched into a cell to seek out and modify a particular stretch of genetic code. What is amazing is that this is million times more efficient and costs much less that ever possible. This genetic cut and paste tool, any segment of DNA can be replaced or deleted.

As you can imagine, numerous ethical issues have come up regarding this technology. impactful Since this technology involves genes there is the question of the future generations. On the other hand, this technique is a dream for a lot of patients. There are cases of oncology patients being cured by gene therapy. Latest patient is Layla, a one-year-old dving of leukemia. When Cutting edge immunotherapy did not help her. researchers were able to rejigger her immune system to attack the cancer cells. Also a biotech company Editas announced it would be using CHRISP to treat a rare form of blindness beginning in 2017. The possibilities and opportunities are endless.

### Fathmath-2BCZ



#### Across-

1-Pneumonia, UTI with high resistance

3- They destroy the tissue that's makes up skin and muscle

- 6- I'm the smallest
- 7- another word for shot
- 9- virus that causes chicken pox
- 10- bacteria that causes bubonic plaque

#### Down-

- 2- causes Athlete's foot
- 4- lives in mosquitoes salivary gland
- 5- short hair like projections on bacterial cell
- 8- You always get a cold because of me

# Not so related is it...?

Breast Cancer is one of the world's most attention seeking concern in today's era. So is Alzheimer's Disease. Who would expect two different conditions to have a link at a significant level? What if we told you that the gene responsible for the Breast Cancer, plays a significant role in the development and sustainability of Alzheimer's disease? We know that the mutation in the BRCA gene, located in the Chromosome 17, is the major contributor to the development of the Breast and Ovarian Cancer. However, according to a recent report, the gene is somehow responsible for the buildup of Alzheimer's. Lennart Mucke and his group at Gladstone Institute of Neurological Disease, according to a report in Nature's Communications, have determined of the damaging effect of the BRCA1 gene, which is, to reduce the capacity of neurons to fix their DNA.

In an experiment with mice, he mutated the BRCA 1 gene. His observations were that the gene is responsible for fixing and repairing the DNA, and after mutation, low levels of the gene resulted in Memory issues. On an inspection of the brains of deceased people with Alzheimer's, it was seen by the scientists that the levels of the BRCA1 gene were in a reduced state upto 75%, than in the brains of dead healthy men. These results imply that there is "somewhat" direct connection between DNA repair and the breast cancer gene. Mucke says, "We think amyloid probably comes first. That depletes BRCA1 and that then leads to the accumulation of DNA damage because they aren't repaired properly." Another observable deduction by the researchers was that the early depletion of the BRCA protein forces the brain to find other ways of DNA repair, and the overall effect is reduced to a certain extent. An innovative way to treat this would be to change the POV and focus on DNA repair, which has not yet been widely pursued.

Arindam Pal-1 BCZ

# Neuro-Bridge- New Elixir of Life

New device allows brain to bypass spinal cord, move paralyzed limbs. It's a technology which can helps a paralysed person in the movement of muscles and this happens because this technology combines algorithms that learn and decode the users brain activity and also there is a high definition muscle stimulation sleeve that translates neural impulses from the brain. It all starts with a Brain computer interface, which is a kind of device that functions independently to the brains normal output pathways and instead processes signals from the brain to control something on a computer. The primary motor cortex is the main source of voluntary movement signals. This area is divided into specific regions to control distinct parts of the body. This primary motor cortex is an ideal site for the braincomputer

interface, because the control of the body parts is highly distributed within these regions. So get ready for a better world with less misery with the advent of neurobridge.

Mohit Bhansali- 2 BCB

# Tid Bit



# **Zombie Bacteria**

The reason for powdered silver's exceptional antimicrobial properties has been revealed, Bacteria that absorb the metal die, but then start killing their neighbors in a zombie-like massacre. Silver is a very effective, though expensive, antiseptic, Silver has been used as an antimicrobial agent for centuries. Bacteria

absorb the silver particles, which is toxic to the cells. Unlike antibiotics,

bacteria cannot develop resistance to silver. Chemists in Israel have discovered the walking dead of the microbial world. It turns out that bacteria killed by silver can kill nearby living pathogens even after they're dead. In the experiment, researchers exposed Pseudomonas aeruginosa to silver nitrate; they observed the dead bacteria acting like sponges, soaking up silver. The dead bacteria were then introduced to a solution of living P. aeruginosa, and the zombies released their silver to achieve equilibrium, unleashing microbial killing. The results showed that, not only does silver persist within the dead cells, but it is an available source for further biocidal activity on viable cells. This mechanism was called as 'Zombie effect' by researchers. To confirm that the silver was responsible, researchers used a control where a P. aeruginosa sample was killed by heat instead. While high temperatures proved equally lethal to the original sample, it did not turn them into zombies. The heatkilled bacteria had no effect on other members of its own species, demonstrating that it is the silver that turns the bacteria into zombies.

#### Mithun P R – Research Assistant



## **HUMAN EMBRYO EDITING**

Recent article published by Chinese researchers in scientific journal - *protein & cell* have shown that these scientists, led by *Junjui Huang* a gene function researcher at Sun Yat Zen university have successfully created human embryos by means of rDNA technology. Although ethically wrong, they have argued that the embryo so created by them cannot grow to be a live human or attain life as its an embryo created by fusing of a single ovum and two different sperms. So there is presence of additional set of chromosomes. This prevents embryos from resulting in a live birth This embryo would undergo initial stages of development And do not divide further and is not viable.

This was achieved by a technology called DNA editing or CRISPR (clustered regularly Interspersing short palindromic repeats). This was done to alter the genes in the human DNA that caused diseases like beta thalassemia or leukaemia which is a genetic blood borne disease and hence the faulty blood cells DNA could be repaired and healthy bone cells could be formed to replace faulty ones. This technique was first discovered in bacteria having immunity against invading viruses. The first reported incident was by science magazine's Elizabeth Penninsi in late 1990's who reported that certain bacterial strains when their DNA was sequenced was found to have palindromic sequences in their genome that was repeated periodically interrupted by completely random sequences of 30 or so basepairs ,that were initially called 'spacer sequences'. These were thought to be junk DNA. But in 2005 she found out that these spacer DNA was actually matching with the sequences of some viruses and hence concluded that it played major role in bacterial immunity.

Bacteria take up the viral DNA and store it as a sort of template in the bacterial RNA to recognise when Invasion of virus with matching DNA occurs. Once this happens the bacterial genome produces RNA copy of the matching viral DNA from its memory code and use an enzyme Cas9 to bind, cut and recombine with the DNA.

This had been used recently to edit genome of mouse embryos and had been pretty much a success.

In case of the research conducted by Huang and his team CRISPR/Cas 9 gene complex was used to cut and splice the human beta globin ,mutations in which cause beta thalassemia. Of the total 86 embryos injected were waited to grow at least 8 cells each and of these 71 survived and 56 were tested for genetical modifications, only 28 were reported success. For this process to be effective in curing of human diseases the success rate has to be 100%.

# "Turmeric Can Heal Malaria"

Malaria, the one most dreaded word, has taken a step in diagnosis space. In this scenario, the only light from all the darkness is the curcumin (found in turmeric) obtained from the roots of Curcuma longa. The parasite has become resistant to all the antimalarials, with the only option to use artimisinins for effective cure. The recent researches shows the advantage of curcumin which not only synergizes with ART but also primes the immune system to protect against parasite recrudescence in animal body. The researchers hence devised a method to convert the curcumin into nanoparticles of 20-50 nm in diameter. These nanoparticles can then be delivered orally to cure the disease. The nanoparticles of curcumin were then mouse infected used on а bv Plasmodium berghei, a relative of Plasmodium falciparum and Plasmodium vivax which cause malaria in animals. The nanotised curcumin killed all the malarial parasites from about 50 percent of mice used in the study. Curcumin leads to morphological changes in the parasite. Research and data suggests that curcumin binds at the interface of alphabeta tubulin heterodimer, which leads to altered microtubules of the parasite. Curcumin is also known to affect a number of kinases in mammalian cells. This action may have an indirect effect on polymerization of microtubules. The curcumin thus exhibits antimalarial action.

Prachi Majumdar-1 BCZ

# Top Cities with highest Biotechnology venture capital-

#### 1- San Francisco (\$1.15 billion)

Not only South San Francisco is the birthplace for biotechnology but also every new year in, biotech begins with the big J.P. Morgan conference in San Francisco. University Of California, San Francisco grabs a place on top 10 research institutes thus providing good input to biotech R&D.

#### 2- Boston/Cambridge (\$933.59 million )

It's a major hub for venture capital in biotech. Most of the big Pharma companies always have their centres in Cambridge because of Harvard/MIT complex in Cambridge.

#### 3- San Diego (\$387 million)

San Diego has retained a top reputation as a significant biotech hub, with a mix of VCs and Big Pharmas at work in the area to give impetus to the prospects of the drug development industry.GlaxoSmithKline decided to dispatch an R&D team to San Diego.

#### 4-Seattle (\$238.11 million)

Seattle happens to be home to the biotech company that roped in 2013's biggest single round: Juno Therapeutics (which creates immunotherapies based on Chimeric Antigen Receptors (CARs) and T Cell Receptors (TCRs) technologies). Seattle is also home to Allen Institute for Brain Science and the Bill & Melinda Gates Foundation. Both of these companies have received a lot of funds for research and development.

#### 5- New York City (\$135.06 million)

It is not only the financial centre of the world's largest economy but also on the verge of becoming a major biotech hub after Local luminaries Celgene and Eli Lilly are teaming up with the city to help launch a \$100 million program to identify 20 major biotech in the city from places like Weill Cornell Medical College and Columbia University Medical Centre , ensuring that major novel innovations can be found from these places and alike.

Darshika Bohra- 2 BCZ

#### New Virus in Town- Zika Virus

Zika is a member of family of virus flaviviridia and of the genus flavivirus transmitted bv daytime-active mosquitoes, such as A. aegypti and A albopictus Its name comes from zika forest where the virus was first isolated in 1947. The infections, known as the zika , often causes no or only mild symptoms. Since the 1950s it has been known to occur within a narrow equatorial belt from Africa to Asia. In 2014, the virus spread eastward across the Pacific Ocean to France then to island and in 2015 to Mexico. Central America, the Caribbean, and South America, where zika out break has reached reached pandemic levels .Zika virus is related to dengue "yellow fever and west nile virus The illness it causes is similar to a mild form of a wild dengue and is treated by rest and cannot yet be prevented by drugs or vaccines. There is a possible link between Zika fever and microcephaly in to babies by mother newborn child transmission as well as a stronger one with neurologic conditions in infected

Adults. In 2015, Zika virus RNA was detected in the amniotic fluid of two pregnant women whose foetuses had microcephaly indicating that the virus had crossed the placenta and could have caused due to mother to child transmission According to the WHO, a causal link between the Zika virus and microcephaly is "strongly suspected but not yet scientifically proven" and "Although the microcephaly cases in Brazil are spatio-temporally associated with the Zika outbreak, more robust investigations and research is needed to better understand this potential link.

Tenzin- 2 BCB

## Dogs to detect cancer-

An initial study has shown that specially trained dogs can detect prostate tumours in Urine and 93 per cent of cases .Dogs capable of sniffing out cancer have approved for use in a trial by UK's NHS. The charity medical detection dogs has gained approval from Milton Keynes university hospital for further trials, after an initial study showed specially trained dogs can detect prostate tumors in urine in 93 per cent of cases. Iqbal Anjum, a consultant urologist at the hospital, he said: "Over the years they have been many anecdotal reports suggesting that dogs may be able to detect cancer based on the tumour's odour. It is assumed that volatile molecules associated with the tumour would be released into the person's urine, making samples easy to

collect and test". Medicinal detection dogs was co-founded in 2008 by Dr Clarie Guest, who was the training director of the first study programme to train dogs to identify cancer in 2003. Dr Guest's experienced the apparent ability of dogs to sniff out the disease herself, when her dog daisy made her aware she was suffering from breast cancer in 2009. The normally gentle dog refused to get in the car, and began prodding Dr Guest in the chest. When she felt the patch, Dr Guest realized it was bruised. Tests revealed she had a benign tumour near the surface, and a deeper malign growth, which could have been severe if not for the early diagnosis. Dr Guest said the incident gave her the "impetus to really believe this could be life-changing for people". She added: "Britain has one of the worst rates of early cancer detection in Europe. The NHS needs to be bolder about introducing new innovative methods to detect cancer in its early Stages. "Our dogs have higher rates of reliability than most of the existing tests. We know their sense of smell is extraordinary. They can detect parts per trillion that's the equivalent of one drop of blood in two Olympic-sized swimming pools. Two charities, the Graham Fulford Charitable Trust and the Prostate Cancer Support Group, have said they are interested in rolling out the diagnostic service once the trial is complete. Gray Steele, who founded the Prostate Cancer Support Group, said his team were "so impressed "by the initial trails into using dogs to detect cancer, saying the PSA test left "a great deal of room for improvement".

Nisha R- 2 BCB

# Kudos!

Put your hands together for these winners-

Shwetha S- 1<sup>st</sup> place color mania MANTECH 2016 CMR Law college

Surjalal Singh and Aljo Anand- 2<sup>nd</sup> place in color mania MANTECH 2016

Ravi and Vasant –  $1^{st}$  place in Bioscience quiz MANTECH 2016

Vandhana and team- 1<sup>st</sup> place in Yummology MANTECH 2016

Ravi and Vasant- 1<sup>st</sup> place in Quiz Bioaura 2016

Shalomi and Sarala- 2<sup>nd</sup> place in model making Bioaura 2016

Radhika and Keerthi- 3<sup>rd</sup> place in Poster making Bioaura 2016

Darshika and Varsha- 1<sup>st</sup> place Instinctive Dive Trigger 2016

Darshika and Nandini- 2<sup>nd</sup> place in Riddle it out Trigger 2016

Sudheer, Sharun and Gagan- 1<sup>st</sup> place in quiz at International Conference on Green Technology for sustainable ecosystem St Joseph's College

# Solution for crossword- Guess the microbe

- 1. Acinetobacter baumannii
- 2. Trichophyton mentagrophyte
- 3. Necrotizing fasciitis
- 4. Plasmodium vivax
- 5. Flagella
- 6. Mycoplasma
- 7. Vaccine
- 8. Rhinovirus
- 9. Varicella zoster
- 10. Yersinia pestis

# In a Glimpse







