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Message from the Principal

I am happy to learn that the Department of Biotechnology is releasing the second edition of 'BIOSTUMAG' along with the International workshop titled 'Extremely Minute seeds: Extensive research' on 19th December, 2018. Wish you All the Best..

Dr. P.V.Basheer Ahammed, Principal, SIAS

MESSAGE FROM THE HEAD OF THE DEPARTMENT

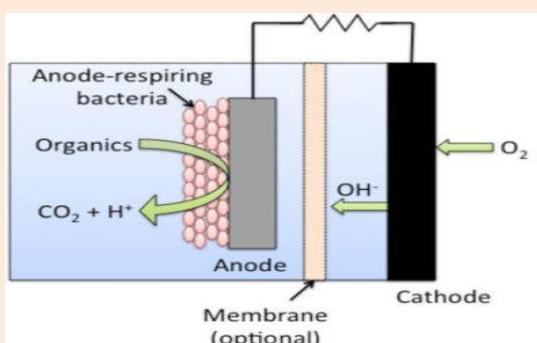
I am gratified to know that the Students of the department of Biotechnology are bringing out the second issue of their magazine "BIOSTUMAG" of this academic year (2018-2019). Good things remain good only because they are always scarce. I am glad to pen for this wonderful magazine as an appreciation of the commendable efforts put forth by the team. This is a productive scientific material and subsidiary skill developing tool for the students. I wish that this BIOSTUMAG establishes to be a flint to fire the enthusiasm and excite their minds for many intrusive innovations among the students and inspire passion among the members of the faculty of Biotechnology department. It was quite inspiring to watch and witness the potential of our students unfolding at various stages and situations each day. I also applaud the coordination and efforts behind the team to bring out this issue. I wish them all success.

Dr. Sahaya Shibu B, HoD, Biotechnology

MICROBIAL FUEL CELLS...

Microbial fuel cells are bioreactors that converts chemical energy present in the organic or inorganic compound substrates to electrical energy through catalytic reaction by microorganisms. MFC have a wide range of applications including serving as household electrical generators and powering items such as small portable electronic devices, boats, automobiles, electronics in space, self feeding robots, biohydrogen production, waste water treatment and biosensor. MFCs do not need to use metal catalyst at the anode, instead they use microorganisms that biologically oxidize organic matter. The mechanism by which microbial cells generate electricity is by the oxidation of substrates. Microbes oxidize substrates in anionic chambers to produce electrons and protons. The electrons so produced then attach to the anode (negative terminal) and flow towards the cathode(positive terminal) through an external circuit while the protons pass across a cation specific membrane to combine with oxygen to form water. This flow thus generate electricity. Species such as Geobacter, Rhodoferane, Shewanella, pseudomonas, clostridium and Desulfuromonas are often used as inoculum in MFCs for electricity production and they are able to oxidise substrates like acetate, ethanol, lactate, butyrate or propionate. MCFs have the added advantages of no net carbon dioxide to the atmosphere upon oxidation of carbon compounds and there is no need for extensive preprocessing of the fuel or expensive catalyst. With depleting oil reserves and natural gas and increased dependence on electric current generation, microbial fuel cells may be the future in bridging the gap between the demand and supply of clean energy.

Contributed by Divija B (3rd Sem.B.Sc BT)



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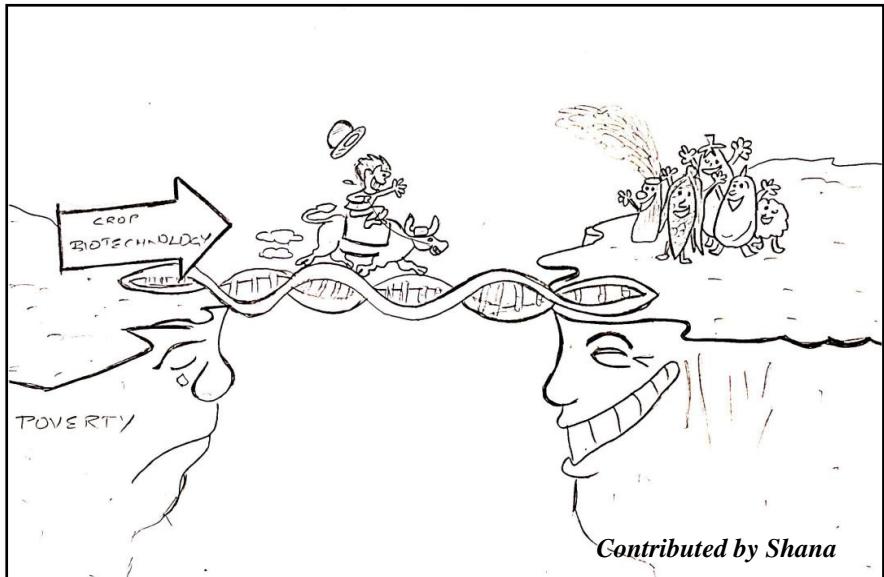
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DID YOU KNOW....

- ✓ Each cell in your body contains about two meters of DNA. About 99.9% of your DNA is exactly the same as everyone else's. The other 0.1% codes for all of the differences that make us unique.
- ✓ With the millions and millions of fingerprint records that have been analyzed, no two duplicate fingerprint patterns have ever been recorded. Only because of fingerprints, identical twins aren't 100% identical.
- ✓ A newborn baby has about one cup of blood in his body.
- ✓ Those who sleep less than six hours a night are more likely to develop colon cancer than those who sleep more.
- ✓ Bioplastics, made from biopolymers are already utilised in plastic food packaging, mobile phone cases, sunglasses, pens and personal care packaging for products such as shampoos and conditioners
- ✓ In 1990 chymosin became the first food enzyme produced using recombinant DNA technology.

Contributed by Jfini Shirin (I. B.Sc)

SCIENTIST TO WATCH

Prof. SAMPA DAS

Prof . Sampa Das is an Indian Scientist whose expertise lies in the field of agricultural biotechnology. She is currently the Head of the Division of Plant Biology at Bose Institute in Kolkata , a multi disciplinary research institution focused on science and technology and is a fellow of the Indian National Science Academy Of Science, India.



She gained her doctoral degree under the supervision of Prof. S.K. Sen of Bose Institute in 1981 with her work focused on studying the mechanism of plant defense responses against pests and pathogens , with an aim to combat their stress.

During her post doctoral training at the Friedrich Meischer Institute in Switzerland; she become interested in plant transformation with interests in increasing the quality of crops including rice, mustard, tomatoes, chick pea and mung bean.

She is also credited with identification of mannose specific binding proteins from garlic and onion which could potentially act as insecticides against sap sucking and coleopteran insects. She is a strong advocate for the use of biotechnology in crop improvement and protection.

Contributed by Khadeeja Hasna V (1st B.Sc BT)



Tasaku Honjo



James P. Allison

He set out to investigate if CTLA-4 blockade could disengage the T-cell brake and unleash the immune system to attack cancer cells. Tasaku Honjo discovered PD-1, another protein expressed on the surface of T-cells. The results showed that PD-1, similar to CTLA-4, functions as a T-cell brake, but operates by a different mechanism . In animal experiments, PD-1 blockade was also shown to be a promising strategy in the fight against cancer. Of the two treatment strategies, checkpoint therapy against PD-1 has proven more effective and positive results are being observed in several types of cancer, including lung cancer, renal cancer, lymphoma and melanoma. New clinical studies indicate that combination therapy, targeting both CTLA-4 and PD-1, can be even more effective, as demonstrated in patients with melanoma. . Until the seminal discoveries by the two laureates, progress into clinical development was modest. Checkpoint therapy has now revolutionized cancer treatment and has fundamentally changed the way we view how cancer can be managed.

Contributed by Fathima Hasna (1st M.Sc)

NEW DRUG TARGETS FOR TREATMENT OF MALARIA

Malaria is caused by the mosquito-borne parasites *Plasmodium falciparum* or *Plasmodium vivax*. When an infected mosquito bites, it transmits sporozoites into a person. Some of these sporozoites establish an infection in the liver where they replicate and later burst out and infect red blood cells. This is manifested as malarial symptoms, such as fever, chills and headaches.

Current malaria drugs are designed to reduce symptoms after infection and these drugs work by targeting parasites replication. Sadly they don't prevent infection and resistance to these drugs are on the rise.

In a recent study published in *Science*, Winzeler and her team took a different approach for identifying new drugs by screening for drugs targeting the malaria parasite at an earlier stage in its lifecycle. Out of the 500,000 compounds tested they were able to narrow the list to 631 promising compounds. Their study utilized a related parasite *Plasmodium berghei*, which can only infect mouse. After extracting sporozoites, they were engineered to produce luciferase, the same enzyme that fireflies use to produce their telltale glow. Positive drugs were selected out by their capacity to switch the glow "off," indicating these compounds had killed the parasites or blocked their ability to replicate. The positive drugs were then confirmed of their potency and compounds toxic to liver cells were not considered further. Interestingly, about 58 of those drugs were found to block the parasite's electron transport chain.

Winzeler and members of the Bill and Melinda Gates Foundation Malaria Drug Accelerator (MalDA), are collaborating to unravel the mechanism by which many of the compounds work against the malaria parasite.

Their goal is to produce a drug which would be affordable and practical for administration in parts of the world without refrigeration or an abundance of health care providers.

Contributed by Jasna K (2nd M.Sc)



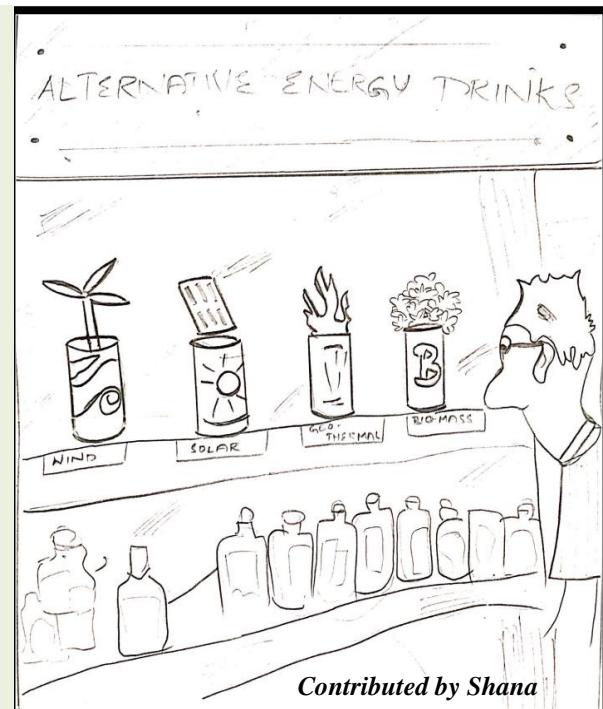
Sporozite isolation

This can be followed by dizziness, drowsiness, altered consciousness, and neurological signs that indicate acute encephalitis. Some people can also experience atypical pneumonia and severe respiratory problems, including acute respiratory distress. Encephalitis and seizures occur in severe cases, progressing to coma within 24 to 48 hours.

Most people who survive acute encephalitis make a full recovery, but long term neurologic conditions have been reported in survivors. Approximately 20% of patients are left with residual neurological consequences such as seizure disorder and personality changes. A small number of people who recover subsequently relapse or develop delayed onset encephalitis. The case fatality rate is estimated at 40% to 75%. This rate can vary by outbreak depending on local capabilities for epidemiological surveillance and clinical management.

➤ Nipah virus infection can be diagnosed with clinical history during the acute and convalescent phase of the disease. The main tests used are real time polymerase chain reaction (RT-PCR) from bodily fluids and antibody detection via enzyme-linked immunosorbent assay (ELISA).

➤ Other tests used include polymerase chain reaction (PCR) assay, and virus isolation by cell culture. There are currently no drugs or vaccines specific for Nipah virus infection although WHO has identified Nipah as a priority disease for the WHO Research and Development Blueprint. Intensive supportive care is recommended to treat severe respiratory and neurologic complications.



Contributed by Shana

Nipah virus

Nipah virus (NiV) is a zoonotic virus (it is transmitted from animals to humans) belonging to the family Paramixoviridae, genus Heniparivirus. The natural hosts of this virus are the fruit bats of the Pteropodidae family. It can be transmitted through contaminated food or directly between people. The virus can also cause severe disease in animals such as pigs, resulting in significant economic losses for farmers.

The incubation period (interval from infection to the onset of symptoms) is believed to range from 4 to 14 days. However, an incubation period as long as 45 days has been reported. Infected people initially develop symptoms including fever, headaches, myalgia (muscle pain), vomiting and sore throat..

Contributed by Resha Haneefa K (2nd M.Sc BT)

Biotechnology Department programs & students achievements

On Sept 19th, 2018, the Biotechnology Department Association (SIAS b-DNA) was inaugurated which was also the 1st departmental association to be inaugurated in SIAS for the academic year 2018-19. Dr. Hari Prasad, (Assistant Manager, Quality Assurance, Sugana Foods Private limited, Coimbatore) was the chief guest. The welcome address was by Dr. Sahaya Shibu (HOD, Biotechnology). The occasion was graced by the presence of Dr. P.V. Basheer Ahammed, Principal, SIAS who delivered the presidential address. The function was felicitated by Ms. Farha Baramy (HOD, Dept. of Microbiology), Mr. Salalaludheen(Librarian), Mr. Jamshel (College union advisor) and Mr. Zainul Abid (College union chairman).

Following the inauguration, Dr. Hari Prasad delivered a talk on 'Advanced Oxidation Process for wastewater treatment'. He highlighted the different waste water treatments and the importance of water quality in industries. The students interacted with him following his informative talk.

Following the talk, Quiz competition was organized by Rohith Kumar, Assistant Professor. Presentation competition were also held and the winners were awarded cash prizes and trophy.

Report prepared by Ehab Ibrahim (Secretary, Biotech student)



Our Ist B.Sc Biotechnology students comprising of Shirin Shahana, Shana, Najiya EP as part of the college group won the 1st prize in Literary Bonanza conducted at providence college, Calicut.

Ehab Ibrahim, Manal Latheef, Joonie Nasmath of I B.Sc Biotechnology won the second prize in the ESPRIT dE CORPS -Best Management Competition held at SIAS

Visit to BIOZEEN.....

Industrial visits helps students to understand the difficulties which an industry faces and provides us with knowledge on how to tackle practical issues industries faces. My class, 3rd year B.SC Biotechnology along with our class advisor Dr. P. Servin Wesley P and other faculties embarked on a fun filled industrial visit on October 26th, 2018. The industry that we visited was BIOZEEN Biotech private limited, Bangalore. The company specializes in fermenters and bioreactors. Dr. Nellaiah, HOD, Training and RD, initially explained about the profile of the company. After the session we were taken to their labs where we were introduced to various devices and equipments manufactured by them. We also had leisure trips in Dandeli and engaged in various activities including camping and cycling. Further we also spent time at various beaches in Goa. As all good things have to come to an end, we returned back to our college on 29th Oct,2018.

Report by Aadhil Sudheer(3rd B.Sc)

