THE BIOSCOPE

Department of Biosciences

INTEGRAL UNIVERSITY, LUCKNOW

• Recent Discoveries

Articles covering recent breakthroughs in science

• Students' Zone

Creative scientific writings, Students accomplishments

• Departmental Activities

Interview reports, Science communication workshop

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SCIENTIFIC NEWS

SCIENTISTS FOUND 2.5 BILLION-YEAR-OLD BACTERIAL ENERGY SOURCE, UNLOCKING ANCIENT POWER

This bacterium subsists on phosphite oxidation, and as far as we know, exclusively on this reaction. It covers its energy metabolism this way, and can build up its cell substance from CO2 at the same time," explains Schink. "This bacterium is an autotrophic organism, like a plant. It does, however, not need light like a plant, as it draws its energy from phosphite oxidation". Surprisingly, it turned out that the bacterium is not only a new species, but actually forms an entirely new genus of bacteria. The biochemical mechanism that the bacterium uses for its metabolism is therefore not new, but has most probably been preserved from the primeval times of our planet: back when life on our planet began and the first microorganisms had to feed on inorganic compounds such as phosphite. Thus the new scientific findings provide clues to the early biochemical evolution on our planet. In addition, they provide the key to a biochemical mechanism that makes life possible in very hostile places, possibly even on alien planets.

<u>https://scitechdaily.com/ancient-power-unlocked-scientists-discover-2-5-billion-year-old-bacterial-energy</u>



DNA REPAIR AT LIGHT SPEED: TARDIS UNMASKING THE MYSTERIES

Researchers at the University of Bonn have developed a technique to accelerate high-throughput microbiological process observations. Exposure to UV rays can alter DNA, which may result in cancer. The human body does, however, possess a defense system that may fix DNA prior to cell division and dissemination. Fluorescent light is used in single particle tracking to mark molecules, making it possible to precisely observe and evaluate diffusion and interactions with biological components. Researchers have developed a method to track DNA repair in cells by analyzing gaps between molecules and the distances traveled by a single molecule from one photograph to another. This allows them to determine when enzymes are performing their repair work and when they are "idle" or diffusing freely inside the cell. However, this method has a drawback as it is difficult to track multiple molecules simultaneously, making it time-consuming and taking longer than the repair process itself.

https://scitechdaily.com/dna-repair-at-light-speed-unraveling-the-mystery-with-tardis/

THE CURE FOR AGING? THE ESSENTIALFUNCTION OF HKDC1 IN MAINTAINING CELL YOUTH

Osaka University researchers have identified HKDC1, a protein crucial for maintaining mitochondria and lysosomes, and preventing cellular senescence. Although the targets of a protein known as TFEB were unknown, there was indications that the protein was involved in preserving the function of both organelles. Through gene-by-gene comparisons and the application of chromatin immunoprecipitation, a technique that allows the identification of protein targets on DNA, the team was the first to demonstrate that TFEB directly targets the HKDC1 gene and that HKDC1 is upregulated in response to mitotic or lysosomal stress. By simultaneously preserving the integrity of these two organelles, the two distinct functions of HKDC1, which play important roles in the lysosome and the mitochondria, contribute to the prevention of cellular senescence. This finding provides new opportunities for the treatment of age-related disorders since malfunction of these organelles is associated with aging.

> <u>https://scitechdaily.com/agings-antidote-the-crucial-role-of-hkdc1-in-keeping-</u> <u>cells-youthful/</u>

FIRST-EVER REGULATORY APPROVAL FOR A GENETICALLY MODIFIED BANANA

Under the guidance of JAMES DALE, a team at Queensland University of Technology added a gene from a wild banana species to produce a QCAV- 4 banana. This step was taken to limit the spread of TR 4. However, this is not produced on broad scale for consumers in Australia as there is small number of outbreaks as of now. Also only 4 GM crops have previously been approved including safflower with higher oleic acid levels and herbicide resistant strains of rapeseed, Indian mustard and cotton.

Dale's team now intends to utilise CRISPR gene editing to make banana even more appealing to farmers by developing black sigatoka resistant QCAV 4 banana. This technique has been implemented by a group in Kenya to produce gonja mangaya strain resistant from a pathogenbanana streak which invades banana genomes.

GM crops are now extensively produced worldwide although in UK and EU only small numbers have been permitted for cultivation.

https://www.abc.net.au/news/2024-02-16/australia-approves-first-geneticallymodified-banana-panama-tr4/103476986

KNOCKING OFF PARKINSON'S DISEASE

In Parkinson's disease the affected person loses the brain cells and other neurons to make neurotransmitter protein. Other symptoms include jittery muscles and tremors and difficulties in- breathing, mood, speech, eating and movement. As Reported by the chemist MATHHEW DISNEY in the issue of the Proceedings of the National Academy of Science (PNAS), the apparent cause is accumulation of a toxic protein called alpha-synuclein, in and around the neurons. Due to its disorganized and unstable structure, dopamine or deep-brain stimulation methods were used instead of drugs. Thus, Disney's lab introduced Syn-RiboTAC drug which targets RNA needed for the protein production. Disney's potential Parkinson's drug binds to a section of messenger RNA and inhibits the "start" signal. Thus, translation doesn't take place and the toxic protein isn't build. The drug showed 50% decrease in the protein production with no side effects and improved brain barrier penetration resulting in delayed or even stoppage of disease progression. This is a two-headed drug ,one hinders the RNA and the other one helps in recycling. Although, the work is still going on for improving the properties, this concept paved a way to better techniques and drug development ideas.

https://www.news-medical.net/news/20240109/New-approach-to-Parkinsons-treatment-focuseson-stopping-toxic-protein-production.aspx

THE KETO DIET'S POTENTIAL PROTECTION AGAINST



EPILEPTIC SEIZURES MAY BE DUE TO MICROBES

It is well recognized that diets that are considerably lower in carbs and much higher in fat can dramatically lessen the frequency of seizures in people with drug-resistant forms of epilepsy, especially in youngsters. Epilepsy affects 50 million people worldwide, causing seizures ranging from inattention to severe convulsions. Most people benefit from medication, but 30% are considered refractory. The keto diet, a diet limiting starches and sugars, has been touted as a weight loss method since the 1970s. While its health benefits are debated, evidence suggests that fat-rich, carbohydrate-poor diets may reduce seizures in refractory epilepsy patients. A keto diet has been found to reduce seizures in mice by introducing the children's microflora into the guts of engineered mice. The study also revealed metabolic changes in both humans and mice related to energy production, amino-acid metabolism, and fatty acid oxidation. The findings could lead to the development of drugs tailored to treat seizures. The research highlights the importance of gut microbiomes in determining body function.

> https://scitechdaily.com/agings-antidote-the-crucial-role-of-hkdc1-in-keepingcells-youthful/

<u>CRISPR TECHNOLOGY CAN NOW ACCURATELY</u> <u>TARGET ALMOST ANY HUMAN GENE THANKS TO A</u> <u>NOVEL ENZYME</u>

Scientists have been working on creating new CRISPR systems for genome engineering and gene therapy since bacteria have the ability to recognize and eliminate viruses' DNA through the usage of CRISPR-Cas, a bacterial immune system. The team tested a new CRISPR tool for potential therapeutic uses in genetic diseases untreatable with the standard system. They tested RETT syndrome, a neurological disorder primarily affecting young females, and Huntington's disease, a rare, inherited disorder causing brain degeneration. The new technology altered previously inaccessible mutations, offering potential therapeutic opportunities. Cas proteins use an RNA molecule to guide the enzyme to a targeted DNA stretch, and a protospacer adjacent motif (PAM) to bind. The Cas enzyme cuts the DNA, triggering desired changes. The most common CRISPR-Cas system is Cas9 from *Streptococcus pyogenes* bacteria, which requires a PAM sequence of two guanine bases in a row.

<u>https://www.goodnewsnetwork.org/new-enzyme-allows-crispr-technology-to-accurately-target-almost-any-human-gene/</u>

THE SECRET POTENTIAL OF GUT BACTERIA:

0

- Chill

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ADAPTING TO OXYGEN FREE WORLD

The gut microbiome, a vital digestive organ, aids in food breakdown and nutrient production, impacting human health. Recent research from the University of Chicago suggests that some microbial allies possess genes that produce energy, potentially impacting human health. Nature Microbiology published research revealing that gut bacteria in an anaerobic environment use 22 metabolites as an alternative to oxygen for respiration. These bacteria possess hundreds or thousands of genes for enzyme production, potentially converting hundreds of chemicals into energy.Compared to bacteria with respiratory metabolisms that exist outside of a host organism and mostly use inorganic substances, these bacteria seem to be more adaptive. Light and colleagues found that the respiratory gut bacteria are specialized in different organic compounds, which makes sense considering the continuous supply of food. Human health is impacted by metabolites found in gut bacteria; individuals with type 2 diabetes have greater levels of imidazole propionate, resveratrol influences immunological and metabolic system functions, and macrophages create itaconate.

https://scitechdaily.com/the-hidden-powers-of-gut-bacteria-thriving-in-an-oxygen-free&world/



ARTICLES BY STUDENTS

BY GROWING ANIMAL CELLS IN RICE GRAIN, SCIENTISTS DISH UP HYBRID FOOD

These cool new alternative like lab-grown chicken and cricket-derived protein are like superheroes for our planet. It's like they're the eco-friendly Avengers of the food world, swooping into save the day. Now, Korean scientists has added new recipe to the list.

14 February 2024, Korean scientists have developed a hybrid food by growing beef muscles and fat cells in rice grains, which is more affordable protein alternative with a smaller carbon footprint. "Imagine obtaining all the nutrients we need from cell-cultured protein rice " say first author Sohyon, who studies under corresponding author Jinkee Hong at Yonsei university in South Korea. Rice already has a high nutrient level, but adding some alternative cells can further boost it.

In animal, biological scaffolds help guide and support the cells three-dimensional growth to form tissue and organs. To cultivate cell-cultured meat, team mimicked this cellular environment using rice. Rice grains are absorbent and have organized structure that provide a solid scaffold to house animal-derived cells in nooks and crannies. Certain molecules found in rice can also feed and promote the growth of these cells, making rice an ideal platform.

Team first coated the rice with fish gelatin, which is safe and food-grade components that helps cells adhere better to the rice. Then, Cow muscles and fat stem cells were inserted into the rice and left in a petri dish for 9 to 11 days for culturing. The final product obtained is a cell-cultured beef rice, which contains the main ingredients that meet food safely requirements and have low risk of triggering food allergies.

To explain the specialty of hybrid beef rice, researchers cooked it in steam and analyzed it's nutritional value, aroma and texture for various food industry applications. The conclusion revealed that hybrid rice contains 8% more protein and 7% more fat compared to regular rice. In terms of scientific sticky and soft texture, the hybrid rice was stronger and more resilience. The hybrid rice with high meat content was released to beef and almonds.

So, Park mentioned that getting protein from livestock has some drawback like using a lot of resources and releasing greenhouse gases. Their team's product, hybrid rice, has a much smaller carbon footprint and could be way cheaper. For every 100g of protein hybrid rice release less than 6.27 kg of CO2, while beef releases 49.89 kg. If commercialized the hybrid rice could cost around \$2.23 per kg, while beef cost \$14.88. "I didn't expect the cells to grow so well in the rice " says Park ."Now I see a world of possibilities for this grain based hybrid food. It could one day serve as food relief for famine, military ration, or even space food"

Mohd. Bilal (B.Sc. Biotechnology 2 year)

HUMAN BRAIN WITH A.I. POWERS

We all know that brain is vital organ of our life. Whatever we think or respond is connected to brain and it communicates through neuro signals. Brain gives Chemical and Electrical signals to move our body parts, but what if there is damage in these signals.

Neuralink, co-founded by ELON MUSK is a neurotechnological company, that has made a coin size chip which will be surgically implanted in skull, with ultra thin wires going into the brain and developing a Brain - Computer Interface. This will read and record the brain activity and literally will connect the actual biology of your body with computer such as mouse, keyboard, phones, etc.

Neuralink, is not the only company, several other companies like Synchron, Precision Neuroscience, Paradromics and Blackrock Neurotech are also working on the same technology.

This technology can be a Symbiotic relationship between humans and artificial intelligence. This can become a greater blessing for deaf, paralyzed, Alzheimer's patients. But there is a high risk factor as well as it deals with brain. And what if the chip get hacked, will they hack your brain? Would you want to put a chip inside your head ? Will this chip make superhumans? Many question arises but imagine if Stephen Hawking could communicate faster than a speed of typist.

In January 2024, Musk claimed Neuralink's first human patient had received a brain implant and they named him LINK. Before human trial, they had implanted their chip in a monkey named Pager who was able to control a computer with brain signals.

Aditi Verma (B.Sc. Biotechnology 1styear)

<u>CRISPR GETS A BOOST :</u> <u>CRISPR-COPIES STREAMLINES GENOME EDITING</u>

CRISPR, is the revolutionary gene editing tool in the field of Biotechnology. The core function of CRISPR is to cut genome at a specific location. Earlier when researchers spend lot of time finding right for insertion of desired gene in an organism.

This tool use algorithms to identify a desired site of gene insertion within minutes. It basically recognizes intergenic sites to minimize risk of unintentional damage.

CRISPR following features

- 1) Provide fast speed.
- 2) It prevents unintentional damage to a gene.
- 3) This tool can be applied on various organisms cells like Fungi, Bacteria, Human cell.

4) This tool helps to reduce various pre-experimental stages, so the scientists can directly focus on the process of designing editing tool.

Development of CRISPR helps in various fields:

1) Researchers can modify organisms to produce valuable chemicals or biofuels.

2) Helps in gene therapy to cure various diseases.

3) Helps to achieve faster and easier way to modify organisms genome to have various new discoveries.

Thus development of CRISPR helps in further advancements in the field of Biology and Biotechnology. The use of CRISPR minimizes safety concerns and help researchers to perform easier and faster method to develop new organisms.

Safa Iltamas (B.Sc. Life Science 3 year)

E. coli's ECO-FRIENDLY ADVANCEMENT: REVOLUTIONIZING ENVIRONMENT-CONSCIOUS PLASTICS FOR A GREENER TOMORROW(2024)

In the face of mounting plastic pollution, scientists at the *State University of New York* have introduced a ground-breaking *E. coli* strain to revolutionize biodegradable plastics. As global plastic waste continues to surge, solutions like *polyhydroxyalkanoates* (PHAs) gain prominence, and the innovative *E. coli* strain aims to redefine their production. Traditionally, the microbial fermentation process used to produce PHAs faced challenges in maintaining precise control over the final composition. This lack of uniformity affected the physical properties of the biodegradable material.

However, the newly developed *E. coli* strain has emerged as a game-changer by synthesizing PHA copolymers with tailorable combinations of monomers. What sets this innovation apart is its ability to fine-tune the physical properties of the plastics for various applications. Unlike conventional methods, where achieving consistency was a hurdle, the tailored copolymers ensure versatility and efficiency in usage. This breakthrough aligns with the growing demand for sustainable alternatives in the face of environmental concerns. As plastic waste doubles globally over the past two decades, there's an urgent need for solutions that not only address the problem but also pave the way for a sustainable future.

The *E. coli* innovation provides a ray of hope by offering a strategic approach to plastic production—one that is customizable, adaptable, and environmentally conscious .In conclusion, the State University of New York's pioneering work with the *E. Coli* strain signifies a significant step toward achieving a balance between technological advancements and ecological responsibility. The tailoring of biodegradable plastics marks a crucial milestone in the ongoing quest for sustainable materials, demonstrating the potential for innovative science to contribute meaningfully to global challenges in 2024.

Arisha Siddiqui (B.Sc. Biotechnology 3rd year)

THE CONCEPT OF INTERMITTENT FASTING

Fasting means a restriction on intake of food. Fasting is very prominent in the Hindu culture since ages. Earlier, people take it as a ritual on Holy days. In scientific terms, Fasting improves our health in many ways. It not only affects on human metabolism but also have a great impact on the human emotions. Nowadays, Intermittent fasting and its effects on human and living creatures are widely studied across the world. Intermittent Fasting means restricting the intake of food for a particular interval of time as per our choices. It includes (*ADF*) Alternate day fasting, time restricted feeding and whole day fasting. A very impressive effect of fasting is observed on human brain.

Fasting stimulates neurogenesis in brain (development of neurons) and also synaptic plasticity. This regulates pain sensation and antiaging ability of the brain. By reducing food intake one can increase their lifespan by 30 or 40%.

Intermittent Fasting reduces inflammation and also reduces oxidative stress. One important thing that happen during fasting is that Fat burns more efficiently during the period and produces Ketone bodies. According to a study, whenever we intake food the energy from it goes to liver and stored in the form of glycogen. Fats digest when stored glycogen depletes. For the depletion of glycogen it takes about 8-12 hours. Once glycogen depletes, Fats burns and produces Ketone bodies. Ketone bodies proves very good for a healthy brain. The ketone bodies go up and its already known that ketones suppresses seizures. Thus, Fasting helps suppressing seizures (burst of uncontrol activity). Fasting is actually a challenge to the brain . Whenever it happens, Neurocircuits in brain got activated and increases the levels of Neurotrophic factors such as BDNF (Brain – derived neurotrophic factor) which promotes the growth and development of neurons. BDNF increases the number of Mitochondria in neural cells. As the number of Mitochondria in neural cells increase, more energy will be produced. As per the daily newspaper "NATURE COMMUNICATION" increasing number of mitochondria in neurons, learning ability increases as synapses will occur more preferentially and stronger electric impulses will be generated. It therefore can be concluded that without eating food our brain works more accurately and efficiently. Thus, we must practice Intermittent Fasting at regular intervals of time to stay healthy and energetic.

Khushi Maheshwari (M.Sc. Microbiology 1styear)

RABIES: NEGLECTED TROPICAL DISEASES

Rabies is one of the neglected tropical diseases that primarily affects the already marginalized poor, susceptible sections of society. Rabies is a viral zoonotic disease that causes progressive and fatal inflammation of the brain and spinal cord. Clinically, it has two forms:

1. <u>Furious rabies</u> – characterized by hyperactivity and hallucinations.

2. <u>Paralytic rabies</u> - characterized by paralysis and coma

Rabies was historically referred to as hydrophobia ("fear of water") due to the symptom of panic when presented with liquids to drink. It lies under the category of rare diseases as there are fewer than 1 million cases per year (India). September 28 is "World Rabies Day". Rabies is present on all continents except Antarctica, with over 95% of human deaths occurring in Asia and Africa. In up to 99% of cases, domestic dogs are responsible for rabies virus transmission to humans. Yet, rabies can affect both domestic and wild animals. It spreads to people and animals via saliva, usually through bites, scratches, or direct contact with mucosa (e.g. eyes, mouth, or open wounds). Children between the ages of 5 and 14 years. Symptoms include fever, headache, hydrophobia, phonophobia, excess salivation, musclems, paralysis, and mental confusion. People may experience:

Pain areas: in the muscles

Whole body: dizziness, fatigue, fever, loss of appetite, or malaise

Psychological: delirium, fear, or hallucination

Gastrointestinal: nausea or vomiting

Muscular: muscle spasms or paralysis with weak muscles

Sensory: pins and needles or sensitivity to light

Behavioural: aggression or irritability

Also common: anxiety, brain death, coma, difficulty swallowing, dilated pupil, drooling, excess salivation, headache, mental confusion, neck stiffness, or seizures

The best way to prevent rabies is by getting vaccinated. If you're bitten by an animal, it's important to wash the wound thoroughly with soap and water and seek medical attention right away. Vaccinating pets and avoiding contact with stray animals can also help prevent the spread of rabies. The rabies vaccine is a vaccine sed to prevent rabies. There are several rabies vaccines available that are both safe and effective. Vaccinations must be administered before rabies virus exposure or within the latent period after exposure to prevent the disease. International organizations such as the World Health Organization (WHO) and its partners support countries to conduct effective dog vaccination campaigns by (i) making dog rabies vaccine banks available to ensure consistent, affordable, high-quality vaccines; (ii) strengthening health and veterinary services to deliver effective dog vaccination coverage. To achieve control and eventual elimination of rabiprogramsmmes, recurrent (usually annual) mass dog vaccination campaigns. Achieving vaccination coverage of at least 70% should be sufficient to maintain the required level of herd immunity in the susceptible dog population.

Mariam Siddiqui (B.Sc. Biotechnology 1styear)

MICROBIAL RENAISSANCE: INNOVATIONS SHAPING THE FUTURE OF MICROBIOLOGY

In today's scientific scene, microbiology stands out as a beacon of innovation and discovery. The complexities of microbial life continue to intrigue researchers worldwide, ushering in a new age fittingly named the "Microbial Renaissance." This era is marked by ground-breaking advances and transformational technologies that are altering our understanding of the microbiome and its consequences for human health, agriculture, and the environment. The basis for our knowledge of microbial life was established by early microbiological investigations. Modern microbiology began with the methods pioneers like Louis Pasteur and Robert Koch devised to isolate and characterise bacteria. Their groundbreaking research gave later generations a starting point for further exploration of the microbial world. When we travel back in time to the present, we find ourselves in the middle of a wave of invention and learning. Our capacity to examine microbial populations in previously unheard-of depth has been completely transformed by high-throughput sequencing technology. The fields of metagenomics, metatranscriptomics, and metaproteomics facilitate the investigation of the genetic, physiological, and metabolic capacities of intricate microbial communities. These methods have challenged our preconceived conceptions about microbial life and its role in forming our environment by revealing previously unknown microbial species and metabolic pathways.

Novel approaches to the study of individual microbial cells have been made possible by developments in single-cell genomics. This method advances our knowledge of microbial life by shedding light on microbial diversity, evolution, and ecological interactions. The integration of cutting-edge technology and multidisciplinary collaboration are highlighted by the Microbial Renaissance. Artificial intelligence, machine learning, and bioinformatics are used to analyse large datasets and derive valuable insights from intricate microbial communities. These methods have the potential to propel microbiology's creativity and speed up discoveries. Furthermore, groundbreaking discoveries have resulted from the application of microbiome research to disciplines including environmental science, agriculture, and medicine. The human microbiome is a critical component of health, impacting both treatment outcomes and the susceptibility to disease. Biofertilizers and microbial inoculants increase crop yield in agriculture while lowering dependency on chemical inputs. Microbial bioremediation techniques reduce pollutants in the environment and improve the health of ecosystems. But despite all of the excitement around the Microbial Renaissance, problems still exist. Degradation of the environment, new infectious illnesses, and antibiotic resistance are serious risks to the sustainability and health of the world. To meet these problems and fully utilise microbiology for the good of society, more funding must be allocated to research, teaching, and public involvement. The future of microbiology will be shaped by advanced genomic sequencing, synthetic biology, and microbiome research. Innovations in CRISPR-based genetic engineering, personalized microbiome therapeutics, and eco-friendly applications will revolutionize healthcare, environmental sustainability, and biotechnology. Understanding microbial communication and harnessing artificial intelligence for data analysis will drive discovery. Emphasis on pandemic preparedness, industrial biotechnology, and interdisciplinary collaboration will address global challenges. In a nutshell, microbiology's future lies in precision manipulation, ecological harmony, and transformative applications, promising a resilient and prosperous future for humanity.

In conclusion, the Microbial Renaissance was a transformational era in microbiology, marked by unprecedented innovation and discovery. By embracing multidisciplinary cooperation, harnessing cutting-edge technology, and solving critical social concerns, we can harness the full potential of microbial life and design a better, more sustainable future for future generations.

Zaryab Shafi

(Faculty, Department of Biosciences) Sameera Siddique (B.Sc. Biotechnology 1st year)

STUDENT ACCOMPLISHMENTS





Yasmin Fatima, an M.Sc. Microbiology student, won first place for her self-written English poetry that was organised by the Department of Languages

Ayushi Singh, a first-year Biotechnology student, won the basketball tournament.





In the 'flash presentation', Adam Ibrahim Garba, a Pharmacy student, took first place, followed by Samiya Zehra Ansari, a fellow first-year Biotechnology student, as the runner-up. Saumya Singh, a second-year Life Science student, and Mohd. Ahmad, a second-year Biotechnology student, shared the third spot.

REPORT OF SCIENCE COMMUNICATION WORKSHOP



The BIOScope, Biosciences Student Council, Department of Biosciences, Integral University, Lucknow Organized 'Science Communication Workshop' on 7th March, 2024 in Hall-1, Central Auditorium at 9: 00am

where our keynote speaker: Miss Srushti Chipde, who is working as a scientific assistant in the field of science communication at the Tata Institute of Fundamental Research, Hyderabad. Her enthusiasm for science and art led her on numerous trips, including the creation of her own podcast, "Purple Science," which combines creativity and imagination while also serving as a wonderful guide to finding your route in the field of science by providing solutions. She is also the founder and director of "The Dancing Neuron." She took an interactive session on science communication. The second half of the 'Science Communication Workshop' took place in the Biosciences Seminar Hall where participants took part in many activities:

• Is this your cup of tea?

A Sci-Art activity that combines design, concept maps and your way of expression Topics for Sci-Art activity were: -Earth elements helping plant for photosynthesis -Newton's 3rd law action reaction -Sustainable development -Artificial intelligence -Genetic makeup of human population

• When science meets fiction

A scientific writing event where you may express your creativity while immersing yourself in exciting scientific circumstances

Topics for science writing were:

-Robert wakes up from cryopreservation in the year 3024 and everything was different from what he expect.. -Aliens got the technology to develop humans and Steve stumbled with his identical twin..

• Yes, and....

An improv activity to test your fast wit and thinking

Total 68 students had registered themselves in the workshop out of which 50 participants has successfully participated in the workshop.

The participants were provided with refreshments and certificates.

The Chief guest of the workshop was Prof. Abdul Rahman Khan (Head, Department of Chemistry and Dean, Controller of Examination), Guests were Dr. Ambreena Sardar Khan (Head, Department of Environmental Sciences), Dr. Alvina Farooqui (Head, Department of Bioengineering), Dr. Snober S. Mir (Head, Department of Biosciences). The Faculty Coordinator for workshop was Dr. Swati Sharma (Assistant professor, Department of Biosciences).





The workshop was successfully coordinated by the creative team of the BIOScope which includes Nashrah Mubeen, Atiya Tarique, Ilma Khan, Deeba Ashhad, Adeeba Aslam, Nashra Kirmani, Meghna Chopra, Yash Nigam, Affiya Azhar, Mohd. Ziad Mirza, Zehra Asif Husain, Tahreem Junaid, Tayyab Zameer, Saim Imteyaz, Mohd. Asad Abbas, Mohd. Arham Khan, Mohd. Ahmad Khan, Samiya Zehra Ansari, Aditi Verma, Fari Fatima and Dania Ahmad.

SCIENCE WRITING

'Science writing' is like storytelling with a scientific twist, unraveling the mysteries of the universe in a captivating manner that sparks curiosity and inspires readers to embark on their own scientific explorations.

ALIENS GOT THE TECHNOLOGY TO DEVELOP HUMANS AND STEVE STUMBLED WITH HIS IDENTICAL TWIN

On the planet of only aliens far from earth nearly 30,000 light years approximately. There was aliens only trying to make progress about how make humans they have heard about from their space system and team of researchers they found something interesting. Aliens got the technology to develop humans through what they got few cells and test tube baby technology they might have known and did something similar to that when they were doing the experiment of making human like creature they found that they can modify it from the nose, head, lips and the body parts. They decided to send it to the planet earth through their time travel door system and transportation machine and they left their experiment of human somewhere on earth. The human like creature was roaming around the town somewhere in India but he was naked and had no clothes because he was not aware of wearing anything but saw everyone wearing flashy and colourful things over their body he saw that someone was drying up their clothes outside their home and he robbed out them and wore it and he was wearing a frock a long blue and white frock with h a puffed sleeves but he had no idea that it was a girls clothing. He left from there to look out for more then he stopped somewhere by looking at the food court and from there steve was coming out from the court after having lunch then he saw someone a male wearing a frock and standing there in awe. He went to see him but he found something very eerie. Steve stumbled by looking at his identical twin. He thought of him as he heard that there are 7 identical people on earth. So he asked his name but the human looking creature said nothing. But steve was a good guy and took him to his home and taught him so many things about human race, what they eat and what to wear as a guy obviously. He did many things and learned a lot and after 7 years the aliens came and took away the human creature. What will happen next? They'll run some test and known and learn more about humans. And thought of making more of the human like creature

Shipra Gautam (M.Sc. Microbiology 1st year) Winner

MAN FROM THE PAST

Robert wakes up from cryopreservation in the year 3024, it was different from what he expected human would have made more progress in science but the view he saw was totally disastrous the world had fallen, the earth was no longer the earth he knew 1000 years ago. He went out to see more. But later did he realized he was alone, the human have been extinct for about 500 years, the cities have abandoned and a new alien species have taken over the earth .The new species were completely different from humans. They fed on some green gel-type liquid for their survival. Later did he kknew that he was spotted by the new species. He started running from them and ran into an abandoned subway metro station. He went in a train trying to calm himself down unaware of the fact that there were still few survivers left. Will Robert be able to find them? Find out in the next chapter.....

Mohd. Affan Mirza (B.Sc. ZBC 1 styear) Runner Up

THE FROZEN FUTURE

Robert wakes up from cryopreservation in the year 3024 and everything was different from what he expected as the whole world did a 180° flip and it was highly difficult for him to grasp all of it at once. Firstly, he tried locating his old home to find a place to stay and after some serious trouble he found it. Upon entering he found some really strange things looking at his direction and it looked like they can attack him at any given moment but still he went forward but as soon as he did so he was almost thrashed to death by those weird yet ferocious creatures. He made a run in hopes of saving his life and at some point he thought that may be he did it but he was so wrong as to think about it.

After entering the main part of the city he looked around carefully and saw how everything is so changed and different and there were several awful looking creatures roaming around everywhere and they looked as if it was a fusion of a human different animals, they all looked so thirsty for blood. Suddenly, he was attacked from behind by numerous creature and then was taken back to the facility he woke up at. He couldn't move and saw something being injected in him and suddenly everything turned dark.

Sumedha Pandey (B.Sc. ZBC 1st year)

SCI-ART

SciArt is a captivating fusion of science and art, where scientific concepts inspire artistic creations. From paintings and sculptures to multimedia installations, it offers a visually stunning exploration of the wonders of the natural world, inviting viewers to engage with science in new and imaginative ways.

Sci-art on the topic 'Artificial intelligence' by Harshita Swaroop of B.Sc. Biochemistry 3 "year.





Sci-art on the topic 'Sustainable Development ' by Raiyyan Kalam of B.Sc. Biochemistry 3rd year.







<u>"EXPLORING THE FRONTIERS OF NEURODEGENERATIVE DISEASE</u> <u>RESEARCH: AN INTERVIEW WITH Dr. ANDLEEB KHAN"</u>



Dr. Andleeb Khan (Ph.D.) is Associate Professor in Integral University, Lucknow, India. She has completed her doctorate from Jamia Hamdard, New Delhi, India in Toxicology with specialisation in natural and active constituents from plants for prevention of Alzheimer's Disease. She has joined as Faculty at Jazan University, Saudi Arabia, She has a teaching and research experience of more than 10 years in neurodegenerative disorders and their prevention with medicinal plants, their active principles and nanoformulations. Her accomplishment at

academics in Master course is outstanding and was able to get the Gold medal, the highest accomplishment for the topper of this course. She has published more than 100 of research publication in national and international journals with more than 3500 citations and a handsome h-index of 31.

She has contributed many book chapters with international publishers including Springer Nature, Academic Press (Elsevier), Taylor and Francis, John Wiley, and Cambridge Publishers. So far, Dr. Khan has edited two books with Elsevier's and Springerlink Nature. Dr. Khan is on the editorial board panel and reviewer of various international journals.

Dr. Khan is handling many projects of national and international importance. She has received many awards, appreciations and recognitions for her services to the science. She holds life memberships of various international organisations and is active participant in national and international scientific events. Currently, Dr. Khan is engaged in studying the molecular mechanism of Alzheimer's disease, and Parkinson's Disease and their prevention by various active principles from natural sources and nanoformulations.

Reported By: Mariyam Nisha (B.Sc. Biotechnology 1st year)

"AROMA ALCHEMY: UNVEILING THE HEALING POTENCY OF NATURE'S FRAGRANT GARDEN" BY Dr. PRIYANKA SURYAWANSHI



Herbal medications, commonly referred to as botanical raw materials, are composed of medicinal and aromatic herbs.

The medicinal and aromatic plants (MAPs) are widely recognized for their ability to produce a wide range of bioactive chemicals, including essential oils, and for their strong antibacterial and antioxidant qualities. The food, cosmetic, and pharmaceutical industries have a high need for MAPs because of these qualities. A well-known agricultural scientist, Dr. Priyanka Suryawanshi, has dedicated her professional life to deciphering the enigma surrounding aromatic and medicinal plants.

Dr. Priyanka Suryawanshi has her PhD from Punjab Agricultural University, where her research area was primarily agronomic management, nutrient management, water management, and crop management of major field crops like rice, wheat and pulses. Currently, she holds a scientist position in the Department of Agronomy at the Central Institute of Medicinal and Aromatic Plants (CIMAP).

Dr. Priyanka Suryawanshi provides us with an overview of her primary research interests, which include agronomic techniques for enhancing the yield potential of important aromatic and medicinal plants including geranium, ashwagandha and tulsi.

She also describes the characteristics of the fragrant and therapeutic plants. These are specialist plants that, in contrast to typical food crops, frequently exhibit higher tolerance to environmental stressors, making them adaptable to a variety of climatic situations. Agricultural sustainability is promoted by their resilience, which allows them to be grown in regions with severe weather. They are adaptable to a wider range of ecosystems due to their capacity to withstand variations in temperature. Additionally, certain MAPs have evolved unique biochemical pathways, producing valuable secondary metabolites that contribute to their medicinal and aromatic properties. Furthermore, the beneficial compounds present in aromatic and medicinal plants have the potential to be naturally pest-resistant, which lowers the need for chemical interventions, in addition to their therapeutic and fragrant benefits. Their dual purpose makes them more appealing in areas where traditional crops could be more vulnerable to pests or unfavorable weather. In light of these climate problems, cultivating aromatic and therapeutic plants offers a viable means of utilizing nature's adaptability and resistance.

Her research is basically inclined towards using medical and aromatic plants as an agronomic input, as green fertilizer, and as green herbicides.

The interview also shed light on Dr. Suryawanshi and her team's publications, notably on allelopathic weed management of medicinal and aromatic crops and using their essential oils as biostimulants to improve the yield of other crops and also as bioherbicides. As she and her group continue to work toward discovering the properties of fragrant and therapeutic plants. Their enthusiasm, knowledge, and persistence in studying these plants benefit all of us.

Dr. Suryawanshi's investigation of distinct biochemical pathways and the adaptability of aromatic and medicinal plants underscores their significance in advancing sustainable agriculture and mitigating reliance on chemical interventions. A comprehensive strategy for maximizing these plants' numerous advantages is indicated by the research's emphasis on using them as green fertilizers, green herbicides, and agronomic inputs. The publications authored by Dr. Suryawanshi and her team, particularly in the areas of allelopathic weed management and the use of essential oils as biostimulants and bioherbicides, serve as additional evidence of the potential uses of aromatic and medicinal plants in contemporary agriculture. For the benefit of agriculture and other fields, the interview offers insightful information about the continuous efforts to discover the mysteries of nature's fragrant garden. Finally, while shedding light on the fascinating world of these plants, the talk with Dr. Priyanka Survawanshi emphasizes the significance of aromatic and medicinal plants in a range of sectors. Her expertise shows a dedicated effort to fully realize these plants' potential, as it is founded on both a solid academic foundation and practical experience. These specialized plants are highly climate-adaptable, as evidenced by the emphasis on agronomic techniques to boost yield and the understanding of these plants' resistance to environmental stresses.

Reported By: Tahreem Junaid (B.Sc. Biotechnology 2nd year)

SHINING ALUMNA



"See the light in others and treat them as if that is all you see." -Dr. Wayne Dyer

In my life, Integral University plays a role as a ray of light and guidance. In the three years of my bachelor's degree, this university has molded me into the most motivated and confident individual I have ever been. I feel immense pride and gratitude for being a part of this prestigious university.

I recalled the day I went to university for the first time with my father to apply for a bachelor's degree in life science. I was apprehensive because it was my first time venturing outside of my comfort zone. Seeing so many learners around me which made me feel so hesitant, and I waspondering how I'll get through this as an introvert. You know, to get something you've never had, you have to do something you've never done, so my goal was simple: I wanted to study and experience college life.

I kicked off my journey and found the best people around me. I got a superb batch, and that batch exemplified the genuine concept of unity in diversity. There was a lot of love and affection among classmates, healthy competitiveness, with no jealousy. They hold a very special place in my heart and I got my four friends for life (Angila, Rushda, Riffat and Mehvish) they stood by me through thick and thin throughout this journey. "Behind every student who believes in themselves is a teacher who believed in them first" And, by God's grace, I got the best professors I could have imagined. I had excellent supervision from professors such as Dr. Pooja, Dr. Uzma, Dr. Swati, Dr. Mohd Salman, and Dr. Idrees, who made learning about life sciences so easy and fun that I began to believe in myself. I gained confidence that I could do well in my chosen field in the future, and they always recognised that potential in me, that gave me pure confidence, and I began to rank among the top scorers in class.I am one of those who believe that science is beautiful. I have always been intrigued about how everything in our bodies and surroundings works, and once I started loving it, there was no turning back. I decided that I wanted to pursue a master's degree in biosciences and began preparing for it during my last semester. It was my desire to study at Jamia Millia Islamia. Believe me. I knew I would pass my entrance exam on my first try, and I did so because of the confidence that Integral University had given me.

In 2021, I graduated from Integral and was admitted to Jamia Millia Islamia to pursue a master's degree in life sciences. By the grace of Almighty in the last semester, I was fortunate to complete my training and dissertation at the AIRF (Advanced Instrumentation Research Facility) at Jawarhaprlal Nehru University (JNU), New Delhi where I learned about "Quantum Dots" and I had the best laboratory experience.

Following admission to JMI, my goal was clear: to become a professor and inspire students with curiosity, knowledge, and wisdom. I am currently preparing for the CSIR exam and working towards my dreams. Hoping to become a good professor soon.

I will always be a proud Integral University alumna; my roots are here. In closing, I want to express my heartfelt gratitude to my family, specifically my sister, as well as my friends and professors, for believing in me. The journey has been fantastic. I wish my juniors a great journey ahead. Be proud of yourself, believe me, you are the light of the future and you are unique. Don't dull yourself with negativity; instead, strive for excellence and success will find you.

Love and warm wishes for your future.

Safia Khan B.Sc. (Hons.) Life Sciences Batch 2018-2021 Department of Biosciences, Integral University







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